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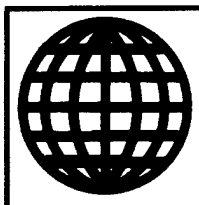

JPRS Report

Soviet Union

Economic Affairs

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JPRS-UEA-90-008 *2 MARCH 1990*

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[Article by Yuriy Rytov: "Who Owes Whom?"]

[Text] Tomorrow is truly unpredictable! I recall that on the eve of this year economists, sociologists, and commentators reflected a great deal about the future. And almost all of them put everyday and production problems in the forefront. How to feed people, provide them with shoes, and give them a roof over their heads. It seemed that there was no more important a task, although tension in interethnic relations in the country's various regions was also felt for a long time. However, it seemed to most observers that all existing—and possible—conflicts were fully solvable in a peaceful and democratic way. And this path was discussed and mapped out accurately—new development of the socialist federation, expansion of the independence of Union and autonomous republics, revival of the uniqueness of big and small nations, and restoration of their primordial rights. Suddenly, stormy events in Azerbaijan and Armenia. And before that, the split of the Communist Party of Lithuania...

M. S. Gorbachev's trip to Lithuania has made it possible to throw light on many in-depth processes, which are taking place in this republic now. In particular, it has become clear that they greatly exceed the limits of purely economic interests and programs. It has become obvious that some Sayudis figures and other extremist leaders are guided by purely political ambitions and pursue far-reaching political goals.

At congresses of USSR people's deputies and at sessions of the Supreme Soviet in Moscow none of the Lithuanian representatives has ever declared that the republic's inhabitants aspired to secede from the Soviet Union. Conversely, they often spoke about their readiness to strengthen the socialist federation in every possible way. However, in the Union republic itself totally different programs and slogans were put forward for internal use.

"I am very surprised when representatives of USSR supreme power say that they give a new breath to socialism. Listen, not a breath should be given to socialism. We are talking about the fact that these laws should be destroyed and the entire so-called Soviet system should be destroyed so that not a stone of it is left standing here. (...) An attempt is made to suggest to us the idea that we will be lost without the Soviet Union, that we are totally powerless, and that our salvation—so-called bright future—lies only in being part of the Soviet Union. As long as we do not defeat this opinion at home in Lithuania and as long as we—all those who today are, or are not, in power in rural or urban areas—do not embark on decisive measures, we will not be able to take concrete steps along the path of independence. (...) If we believe that our stay within the Soviet Union is illegal and that we have the right to exist and to live under Europe's roof, from where we were pulled out, we ourselves should do this. People who think that we have to ask Moscow's permission are very much mistaken..."

These words belong to K. V. Motek, USSR people's deputy, member of the Sayudis Sejm Council, lawyer in the Vilnyus Legal Advice Bureau. (The Lithuanian television program "Vyaydrodis"—"Mirror"—of 14 November 1989).

Perhaps, however, the Vilnyus lawyer defends only his own personal, although particularly extreme, point of view? No, among USSR people's deputies from Lithuania there are many people who hold views similar to his.

"To the question 'what are now the first three basic steps' my answer is as follows: The first is an urgent and purposeful implementation of the Citizenship Law. It is necessary to find out as soon as possible who agrees to assume the obligation to strive for independence in such a way and to assume new legal obligations resulting from this. (...) The second step is the same purposeful action for the establishment of an independent Communist Party. A free Communist Party of Lithuania should be established despite the effect of foreign and internal conservative forces. The third immediate step and just as significant as the first two—elections to a new supreme soviet and to local soviets. People capable of acting in a new way should appear both in Vilnyus and in other centers of political life. We will enter into ever more obvious and profound contradictions with Moscow and we must get used to displeased shouts. Sometimes I even feel sorry for people from Moscow, who so primitively defend their primitive claims. In general, however, we should manifest resoluteness."

This is the credo of R. A. Ozolas, USSR people's deputy, member of the Sayudis Sejm Council, editor-in-chief of the newspaper ATGIMIMAS (REBIRTH) ("Evening News" of 17 November 1989).

R. V. Gudaytis, USSR people's deputy, member of the Sayudis Sejm Council, secretary of the party organization of the Lithuanian Writers' Union, spoke no less frankly about his political platform (in the article "The Last Opportunity" in LITERATURA IRMYANAS—LITERATURE AND ART—(23 September 1989):

"Attempts to find a way out, unwillingness to admit to the historical untruth inherent in the foundations of the USSR, and the practice of manipulating the phraseology concerning democracy and general human values for the purpose of lulling people's vigilance push us to secede from the USSR. To remain in the reformed unitary state means to doom Lithuania to dependence on a diplomatically concealed dictate, to a minority of its representatives in party and parliamentary forums in Moscow, to conflicts, and to a minimal flourishing in the ocean of poverty..."

It seems that there are sufficient examples. A concrete program of actions aimed at Lithuania's accession to power and self-separation clearly emerges from the speeches of Sayudis leaders on republic television, in the local press, and at rallies. Looking back, one can see with what precise consistency the outlined program was implemented and what a vast arsenal of means—it can hardly be called gentlemanly—was used in the process. Appealing to the national sentiments of the native population, Sayudis consciously counterposed Lithuania's interests to the interests of other Union republics and the Union as a whole and tried to obscure the true essence of economic and political relations between them and to distort the true picture of the processes of perestroyka in the country.

We will look truth in the eyes: The tactics chosen by Sayudis have already been crowned with considerable success for it. Relations between Lithuanians and representatives of national minorities have become aggravated. Monopoly control over mass information media has been established. Penetration into existing power structures, political isolation of ideological opponents, and mass pressure on the republic's Supreme Soviet to work out political solutions needed by Sayudis have become facts. Finally, the formation of an independent Communist Party of Lithuania.

All these are milestones that have already been crossed. What is next?

Next, in all probability, Sayudis will strive for a victory in the republic's Supreme Soviet and local soviets. Then it will demand the withdrawal of the Soviet Army from Lithuania's territory and its replacement with national military formations. Well, and then a step, which is completely logical in the existing situation, should be expected: a referendun on secession from the USSR.

The right of nations to self-determination... It is quite obvious that this is an unshakeable constitutional right and the basis for socialist federalism. It is only a matter of developing a mechanism for the exercise of such a right—a mechanism fully taking into account all the existing realities: economic, social, and political. What is to be done, for example, with people who will not want to become citizens of the new independent state? What is to be done with production and social projects built at the expense of the Union budget? And how, under what conditions, should the established cooperative ties be retained?

If under these realities all the possible consequences of the republic's secession from the USSR are thoroughly analyzed and evaluated, undoubtedly, the picture of the cloudless life "under Europe's roof" will greatly fade.

We will once again turn to the past and go back to the second session of the USSR Supreme Soviet, where the draft of the Law on Economic Independence of the Lithuanian SSR, the Latvian SSR, and the Estonian SSR is being discussed. V.-E. G. Bresis, chairman of Latvia's Council of Ministers, speaks:

"Comrades, I present the following report: According to the data of the Latvian SSR State Committee for Statistics, as of 1 January 1989 the residual value of state productive fixed capital without the sphere of circulation and transport totaled 5.6 billion rubles. However, in 1971-1988 a total of 11.3 billion rubles, that is, twice as much as the residual value of fixed capital, was transferred to the Union budget and to superior Union ministries. It is interesting—to whom and for what we should pay?"

In fact, it is interesting. Why did the respected chairman of Latvia's Council of Ministers decide to show people's deputies only one side of the medal and was silent about its other side? Yes, all these years payments from the Baltic, as from all other, republics have entered the Union budget. At the same time, however, they have been returned with interest—from the Union budget to republics!

The reader can be easily convinced of this if he turns to table No 1.

Structure of State Budget Revenues of Union Republics. 1989 in Relation to 1970: Rates of Growth in Percent (1970—100 percent)

	Republics' own revenues	Deductions from all-Union revenues
Total Throughout Union republics	220	420
Lithuanian SSR	230	350
Latvian SSR	190	560
Estonian SSR	200	380

As we see, whereas in Latvia during past years internal budget revenues increased 1.9-fold (much less than, on the average, in the country), the share of deductions from the center increased 5.6-fold (much more than, on the average, in the country). It is sinful for the inhabitants of the Baltic region, if for anybody, to complain about the stinginess of the "big purse"....

I will cite some other statistical data. This year, according to planned calculations, (per-capita) expenditures on social and cultural measures will be 448 rubles 73 kopecks in the Lithuanian SSR, 474.58 rubles in the Latvian SSR, and 495.97 rubles in the Estonian SSR. However, on the average, in the country this amount is only 397 rubles 58 kopecks...

The following data can also be made more specific. For example, in 1990 a total of 96 rubles 30 kopecks will be spent on public health per resident in Lithuania, 100.22 rubles, in Latvia, and 97.92 rubles, in Estonia. However, on the average, in the country—87 rubles 71 kopecks...

The contribution of the Union budget to the production development of the Baltic republics was no less substantial. At the Congress of People's Deputies the chairman of Latvia's Council of Ministers stated that the value of productive fixed capital was 5.6 billion rubles (according

to the data of the USSR State Committee for Statistics, 5.7 billion). However, he forgot to mention that this capital was created mainly from centralized investments and belonged primarily to enterprises under Union subordination. Table No 2 convincingly attests to this.

Increase in Industrial Productive Capital (in billion rubles)

	1970	1975	1988
Lithuania: Total	2.2	3.9	9.6
Including at enterprises under Union subordination	0.9	2.4	6.3
Ratio in percent	40	62	66
Latvia: Total	1.9	3.1	5.7
Including at enterprises under Union subordination	0.8	2.0	3.6
Ratio in percent	43	64	63
Estonia: Total	1.5	2.5	4.6
Including at enterprises under Union subordination	0.6	1.7	2.7
Ratio in percent	36	68	59

It is easy to become convinced that in the last 18 years the proportion of productive fixed capital of enterprises under Union subordination has increased more than 7-fold in the Lithuanian SSR, 4-fold in the Latvian SSR, and 4.5-fold in the Estonian SSR. As you see, it is not quite simple to determine who owes whom. Nevertheless, speaking at the Congress of People's Deputies, representatives of all Union republics without exception considered themselves offended and left out!

Confirming the figures presented in Table No 1, N. N. Danilyuk, chairman of the executive committee of the Khabarovsk Kray Soviet of People's Deputies, for example, asked the congress in bewilderment: "Why do the inhabitants of the Baltic region receive 100 rubles per person for public health, while the inhabitants of the Far East, 50 to 55 rubles?" According to him, he had already addressed this question to the USSR Ministry of Finance. And he heard the following answer: This is how it turned out and now it is impossible to get away from it.

It should be added that at the very beginning of work of the Second Congress the Russian Deputy Club circulated its resolution "On the Social-Economic and Political Situation of the Russian Federation." There the same problem was examined on a global plane. In the opinion of the authors of this resolution, an analysis of the USSR state budget and of the budgets of Union republics has shown that a hidden withdrawal of more than 40 billion rubles from funds earned by the Russian Federation has also been planned for this year. At the same time, more than 41 billion rubles of net profits of enterprises located on RSFSR territory are transferred directly to the budgets of some Union republics. Such a hidden redistribution is based on a distortion in prices, that is, an artificial reduction in the prices of products of raw-material sectors and an increase in the prices of products in consumer demand in relation to prices on the world market.

"The existing production structure," the resolution noted, "under which the bulk of the enterprises for the extraction and processing of minerals are concentrated on the territory of the Russian Federation, puts the RSFSR under obviously worse territorial cost-accounting conditions. The actual large-scale withdrawal of Russia's financial resources does not enable it to solve its ecological, production, and social problems, to restore destroyed villages and rural centers, and to build roads."

Representatives of Kazakhstan, Uzbekistan, and a number of other Union republics also expressed similar grievances at the session. In particular, N. A. Nazarbayev, first secretary of the Central Committee of the Communist Party of Kazakhstan, cited the following facts in his speech: The average wages of workers and employees in Estonia are the highest in the USSR, whereas in Kazakhstan, at the sixth place. Per-capita payments and privileges from public consumption funds in the Estonian SSR are in the first place, whereas in Kazakhstan, the seventh; in per-capita provision with housing they occupy the first and the tenth place respectively. "To be sure, it is incorrect to reiterate," the deputy declared, "that in Estonia people work better than in other regions, because they have such a secure life. The roots are much deeper."

Where are they, these roots?

Kazakhstan delivers to the internal market a significant part of the metals (especially nonferrous, rare-earth, and noble), coal, petroleum, and agricultural raw materials produced in the republic. Resources worth more than 9.5 billion rubles are annually transported to the country's other regions. A total of 4 billion rubles are lost on this annually, because prices of raw materials on the internal market are much lower than world prices. Furthermore, the republic budget is rendered lifeless by the low share of the turnover tax: in Estonia, which "sits" on the final product, more than 46 percent, whereas in Kazakhstan, 29 percent.

From the above-cited examples it is evident how deeply the intra-Union division of labor has been instilled, how diverse cooperative production ties are, and what a wide scale the mutual exchange of products and goods among Union republics has acquired. Is it possible to get an objective picture of such a mutual exchange throughout the country? Yes, it is and not only in internal, but also domestic, prices. True, world prices are calculated only with respect to 1987. Therefore, all the remaining indicators are taken for the same period. It seems, however, that they also characterize the presently existing realities with a sufficient degree of reliability.

Thus, we invite readers to study another table—No 3.

Total Volume of Import and Export of Products Throughout Union Republics in 1987 (in internal and world prices; million rubles)

	Import, including from foreign countries		Export, including to foreign countries		Excess of import(-)/of export(+)	
Union republics	in intra-Union prices	in world prices	in intra-Union prices	in world prices	in intra-Union prices	in world prices
RSFSR	131471	99259	102711	140543	-28760	41284
Ukrainian SSR	50179	49374	43998	43956	-6181	-5418
Belorussian SSR	17707	18961	18864	16469	1157	-2492
Uzbek SSR	12974	11321	8974	6959	-4000	-4362
Kazakh SSR	16352	16147	8811	8494	-7541	-7653
Georgian SSR	6069	5286	5744	3515	-325	-1771
Azerbaijan SSR	5554	5161	6763	5113	1209	-48
Lithuanian SSR	6968	7861	5870	4326	-1098	-3535
Moldavian SSR	5915	5055	5627	3185	-288	-1870
Latvian SSR	5593	5271	4693	3550	-900	-1721
Kirghiz SSR	3490	2924	2324	1519	-1166	-1405
Tajik SSR	3451	2867	2264	1558	-1187	-1309
Armenian SSR	4071	3025	3937	2486	-134	-539
Turkmen SSR	2925	2605	2447	2500	-478	-105
Estonian SSR	3633	3316	2944	1964	-689	-1352

The table needs significant comments. The point is that the total balance of import and export of products is formed of two parts. The first is the interrepublic exchange of domestic products. Here the export of some republics is the import for others and, naturally, the exchange balance will be zero. And the second part—the economic turnover of export to and import from foreign countries calculated in intra-Union prices.

Thus, if we examine only the interrepublic exchange of domestic products (the table does not designate it separately), it is easy to reach the following conclusion: Seven republics have a positive balance (excess of import over export)—the RSFSR (3,649 million rubles); the Belorussian SSR (3,145); the Azerbaijan SSR (2,040) the Ukrainian SSR (1,561); the Moldavian SSR (633); the Armenian SSR (588); the Georgian SSR (577 million rubles).

The other eight republics (Central Asian and Baltic republics and the Kazakh SSR) have a negative balance: from 242 million rubles in Estonia to 5,431 million rubles in Kazakhstan (we will mention once again—the data are for 1987).

However, do these figures express the real picture of the product exchange among republics? No, they do not. The imperfection and disproportions of the internal prices presently in effect significantly distort the ratio among all the presented indicators.

For example, it is known that the turnover tax on consumer goods from agricultural raw materials is realized in prices of finished products. Consequently, republics, where the final operations take place, derive the biggest benefit. Yet regions producing raw materials also participate in the creation of such products.

And if we apply another system of formation of the turnover tax (which many economists have been proposing for a long time)—a system proportional to the labor expenditures of every region—the structure of the commodity exchange among republics will change significantly. Most republics, which supply agricultural raw materials, stand to gain from this; for example, the Uzbek SSR, 1.5 billion rubles, the Azerbaijan SSR, 1 billion rubles, and the Moldavian SSR, 0.9 billion rubles. However, in the RSFSR the balance of the interrepublic commodity exchange would worsen by approximately 7 billion rubles.

Now about the second component of the commodity exchange—foreign trade operations. Here the situation is also incredibly complex.

A startling fact: During calculations in intra-Union prices all Union republics without exception have a negative balance of foreign economic relations, including the RSFSR—32,409 million rubles.

"How is this possible," the reader will ask. "Does Tyumen petroleum really not save the situation?"

It does and how. During calculations of foreign trade operations in foreign currency rubles, in particular, it becomes clear that the RSFSR export volume exceeds the import volume by 12,817 million rubles—by almost 13 billion!

Where did these "surpluses" go? They were almost fully (12.4 billion rubles) spent on imported purchases transferred to other Union republics. The Ukraine received 3.6 billion rubles, Kazakhstan, 1.9, Azerbaijan and Belorussia, 0.9 each, Moldavia, 0.8, Kirghizia, Georgia, and Armenia, 0.7 each, Latvia, 0.6, Estonia, 0.5, Lithuania and Uzbekistan, 0.4 each, Turkmenistan, 0.3, and Tajikistan, 0.1.

To what is such a redistribution due? To a simple reason. In all other republics (except for Uzbekistan and Tajikistan) currency proceeds from export were insufficient to cover their import purchases. In particular, in 1987 the Lithuanian SSR had a negative balance in foreign trade activity in the amount of 229 million foreign currency rubles, the Latvian SSR, 314 million rubles, and the Estonian SSR, 223 million rubles.

Naturally, in the last 2 years the situation has changed significantly. Our positions on the world market have worsened and last year we had a negative all-Union balance of the foreign trade turnover. Nevertheless, 1987 data make it possible to judge the tendency that has persisted steadily during many years.

Now we can also evaluate the total volume of import and export of products throughout Union republics. After the redistribution of the received currency funds and their recalculation into internal prices we add both parts of the commodity exchange—domestic and export-import products—and we obtain the figures presented in Table No 3.

After all the above-stated it was to be expected that we would arrive at a paradoxical result. And it turned out so. The total balance of import and export of products was positive only in Belorussia and Azerbaijan...

That is why another recalculation of prices was needed—this time from internal into world prices. What has come to light now?

For the majority of Union republics world prices are not at all as favorable as internal ones. The products of light and food industries on the world market are much cheaper than on the Union market. At the same time, petroleum products, gas, ferrous and nonferrous metals, and many types of equipment are more expensive abroad than inside the country. Therefore, USSR people's deputies quite rightly noted the following in their speeches: Many republics are now under preferential conditions, purchasing from their neighbors raw material resources at low prices and supplying them with light and food industry products at prices much exceeding the world level.

When the direct import and export of Soviet-made products (without the foreign economic turnover) are calculated in world market prices, the commodity exchange balance improves only in two Union republics—in the RSFSR, by 25 billion rubles and in the Turkmen SSR, by 0.24 billion rubles.

In all other republics this balance undergoes significant changes for the worse. The Ukraine—minus 5.45 billion rubles; Belorussia, 5.4 billion; Uzbekistan, 0.6; Kazakhstan, 1.15; Georgia, 2.1; Azerbaijan, 1.8; Lithuania, 2.9; Moldavia, 2.1; Latvia, 1.1; Kirghizia, 0.5; Tajikistan, 0.3; Armenia, 0.85; Estonia, minus 0.9 billion rubles...

Let readers excuse us for the abundance of figures. Perhaps, however, those who will want to make the necessary calculations independently will need them. The overall finish is as follows: In world market prices only two republics (the RSFSR and Azerbaijan) have a positive balance of the interrepublic exchange of domestic products; instead of seven republics—during calculations in intra-Union prices...

And now it remains to determine—in world market prices—the total balance of import and export of products, which includes both their interrepublic exchange and export-import operations. The reader, who has carefully followed all the preceding calculations, can easily predict the final result. Yes, the total balance improves precisely in the RSFSR and by a very big sum—70 billion rubles. The Ukraine adds 0.8 billion rubles and Turkmenia, 0.4 billion. In all other republics the total balance of import and export of products in world market prices gets another additional "minus" sign.

Belorussia, minus 3.6 billion rubles; Uzbekistan, 0.4; Kazakhstan, 0.1; Georgia, 1.4; Azerbaijan, 1.3; Lithuania, 2.4; Moldavia, 1.6; Latvia, 0.8; Kirghizia, 0.2; Tajikistan, 0.1; Armenia, 0.4; Estonia, minus 0.7 billion rubles.

And the concluding result: Only the Russian Federation has a total positive commodity exchange balance—41.3 billion rubles. I emphasize—a balance calculated in world market prices.

It seems that the reader himself will now be able to answer the question: Who owes whom?

However, we involuntarily have a question for the leaders of Sayudis and similar organizations in Latvia and Estonia. The figures and calculations presented in this article are no secret to anyone. Competent economists, including from the Baltic republics, are well familiar with them. Thus, why have these figures and calculations, why have the realities of our life, not become known to the people of the Baltic republics themselves, who are ready to determine their fate?

At the end of last year after long discussions the Second Congress of People's Deputies approved by a majority of votes the program for improving the economy submitted by the government.

The program has been widely covered in mass information media and is sufficiently known. Therefore, I would like to emphasize only one circumstance: All the proposals of Union republics were carefully analyzed and taken into account during its elaboration. The program

noted in a balanced and realistic manner the limit of the possible—for everyone separately and for the country as a whole—and verified and calculated the balance of our general national and international interests. Is it reasonable to tear down all this?

We will give the reader the opportunity to reflect on his own on the facts and figures presented in the article. To us, however, it is quite obvious: Separatism is a blow not only to perestroyka and to the Union of Soviet Socialist Republics. It is also a blow to the Union republics themselves and to the true interests of their people.

LiSSR Economic, Trade Statistics Reported

904A0145A Vilnius SOVETSKAYA LITVA in Russian 25 Oct 89 p 3

[Report by LiSSR State Committee on Statistics: "Economic Ties of the Lithuanian SSR"]

[Text] With the republic's transition to work under conditions of economic independence, it is necessary to at least quantitatively assess its economic ties and exchange of goods with Soviet republics and other countries.

According to data from the Lithuanian SSR State Committee on Statistics, imports in 1987 reached almost seven billion rubles' worth of goods, an 18.5 percent increase over 1982, and exports rose by 5.9 billion rubles, a 22 percent increase over 1982. Imports were 18.7 percent higher than exports. This gap has grown more slowly over the last five-year plan (2.6 points) than in the period from 1977 to 1982 (12.8 points).

In 1987, 23.8 percent of the gross social product produced here left the republic (2.0 percent was exported). Imported goods made up 27 percent of material resources consumed in the republic. This percentage was almost exactly the same as in 1982 and 1977.

Industrial production made up the largest share of imports (96.7 percent): machine manufacturing and metal-working made up 33.5 percent; the fuel industry (oil and petroleum products, gas, coal and other fuels) made up 15.1 percent; light industry made up 14.0 percent; the food industry made up 7.8 percent; ferrous metals made up 5.4 percent; and agricultural production made up 3.2 percent. Over the last five-year plan imports of electric-powered goods rose significantly—1.7 times—doubling its share in total imports. Fuel industry imports rose by 34.4 percent, and machine-building and metal-working industry imports by 46.4 percent. Food industry imports decreased by 25.9 percent, and light-industry imports by 7.8 percent. Agricultural imports increased by 23.3 percent, and livestock imports by 64.4 percent. Of the volume of goods entering the republic in 1987, 15.9 percent were imports from abroad. If in the period of 1977-1982 imports increasd almost 1.7 times, then in the last five-year period they decreased by 3.4 percent.

The republic imported goods from 102 branches of industry and the national economy (of the 103 that are regularly observed). Owing to import goods, 90-100 percent of the demand for material resources in 25 industries was met.

Sixty percent of the industries observed in 1987 had a negative export-import balance (more was imported than exported). These were areas of production requiring resources which are either restricted or unavailable in the republic.

The republic's needs in the following areas were met by imports: oil, coal and shales, ferrous and non-ferrous metals, tractors and motor vehicles, mobile cranes, many types of agricultural equipment, pumps, pipes, tire-covers, commodity cellulose and other goods for industrial and technical use.

The republic imported goods manufactured in the RSFSR (at 53.2 percent of the cost of imported production), in the Ukrainian SSR (11 percent), in the Belorussian SSR (nine percent), in the Latvian SSR (3.3 percent), and in the Estonian SSR (one percent). Imports from the RSFSR grew during the last five-year plan and over the last ten years, but imports from the Ukraine and other republics have decreased.

Electric-powered goods were imported mostly from Latvia (90.1 percent); coal was imported from the PNR [Poland] (69.4 percent) and from the Ukraine (24.8 percent); imports of ferrous metals were mainly from the Ukraine (28.3 percent) and the RSFSR (58.8 percent); most goods from the machine-building and metal-working industries are imported from the RSFSR (63.2 percent) and the Ukraine (12.9 percent). Of the volume of light industry goods supplied, 30.1 percent were imports and 24.7 percent were goods from the RSFSR; 71.3 percent of plant industry goods supplied were imported.

Of exports from the republic, the greatest share (98 percent) was in industrial production, including production of the machine-building and metal-working industries (31.5 percent), light industry (24.1 percent), the food industry (18.3 percent), the fuel industry (8.3 percent), and the chemical and petrochemical industries (6.1 percent).

During the last five-year period exports increased in electric-powered goods (2.7 times); in the timber, woodworking and pulp and paper industries (48.5 percent); in the chemical and petrochemical industries (24.3 percent); and in the food industry (29.8 percent). However, there was a slow-down in exports in the machine-building and metal-working industries (20.6 percent from 1982 to 1987, down from 36 percent from 1977 to 1982) and in light industry (six percent, down from 19.5 percent).

Goods from the food industry are delivered to the all-union reserves and also exported on inter-republic exchanges. In 1988, 43.2 percent of the state's resources

in meat and meat products (including meat) were delivered to the all-union reserves outside of the republic (not including local union consumers)—that is 0.7 of a point higher than in 1987. In 1988, 34.1 percent more meat and meat products were delivered to the all-union fund outside of the republic than in 1983. The production of meat in the public sector increased in the last five-year period by 21.7 percent, while the mid-year population figures showed a growth of 4.3 percent.

In 1988, 38.3 percent of all of the state's resources in milk and milk products (including milk) were delivered to the all-union reserves outside of the republic. In 1983, the figure was 45.9 percent.

In 1988 the republic supplied, on the basis of interrepublic exchanges of goods (by initiative and state plan) and for export, 30.8 percent of its confectionary goods, 70.8 percent of its fish, 67.2 percent of its canned fish, 31.1 percent of its tobacco products, 40 percent of its canned vegetables, 24.7 percent of its canned fruits, and 18 percent of its sugar. The republic also takes part in an exchange of non-industrial goods. In 1988 the republic supplied, for exchange and export, 46-72 percent of its manufactured textiles, 24 percent of its sewn goods, 38 percent of its knit goods, 52 percent of its stockings and socks, 83 percent of its rubber footwear, 88 percent of its televisions, 96 percent of its bicycles and mopeds, 71 percent of its cassette players, 90 percent of its refrigerators, 77 percent of its domestic electric vacuum cleaners, 31 percent of its furniture.

Goods were exported from the republic from 88 designated branches of industry and the national economy (of the 103 branches which are regularly observed). In exchange the republic buys and imports goods and manufactured items which are in short supply.

Goods produced in the republic were sent to the RSFSR (49.5 percent of all exports), the Ukrainian SSR (13.1 percent), the Belorussian SSR (8.3 percent), the Latvian SSR (7.1 percent), and the Estonian SSR (1.9 percent). Exports to the RSFSR have noticeably decreased in the last ten-year period (while imports from this republic increased), as have exports to the Ukrainian SSR. Exports to the Belorussian SSR increased (in 1977 they were at 6.2 percent—in 1987 they made up 8.3 percent), as have exports to the Latvian SSR (six percent and 7.1 percent).

In 1987, 38.9 percent of production from the oil and gas industries was sent to Latvia and 44.9 percent was exported to other countries; more than half of the production from ferrous and non-ferrous metal industries (including scrap metal) was exported to the RSFSR; 34.1 percent of the production from chemical and petrochemical industries was exported to the RSFSR, 15 percent was exported to the Ukrainian SSR, 12 percent to the Belorussian SSR, and almost the same amount to the Latvian SSR. Of production by the machine-building and metal-working industries, 47.0 percent was exported to the RSFSR, 21.3 percent to the Ukrainian SSR, and 10 percent to the Belorussian SSR. Of production by light industry, 53.2 percent was exported to the RSFSR and 16.2 percent to the Ukrainian SSR. Almost eighty percent of production from the food industry was exported to the RSFSR.

The highest trade turnover (exports to imports) took place in the RSFSR: in 1987 it exceeded six billion rubles, or 52.2 percent of the entire trade turnover, and in the last five-year period it increased by 38 percent. The republic's trade turnover with the RSFSR in the last five-year period was negative (in 1982 it was 303 million rubles, and in 1987 it was 891 million). The trade turnover with the Belorussian SSR from 1982 to 1987 came to 959- 1,056 million rubles, or 8.2 percent of the entire trade turnover. The export-import balance was negative, although over the last five-year period it decreased significantly (in 1982 it was 355 million rubles—in 1987 it was 80.6 million). The trade turnover with the Latvian SSR came to 662 million rubles and increased by 26.7 percent over the last five-year period. In 1987, the amount of exports to the Latvian SSR exceeded imports by 167.9 million rubles. The trade turnover with Estonia came to 178.5 million rubles and increased by 9.8 percent. The balance was positive (exports of goods from the republic exceeded imports from Estonia by 37.7 million rubles). The republic's trade turnover with the Baltic republics in 1987 came to 841 million rubles, or 6.5 percent of the entire trade turnover. Its share decreased in the last ten years (in 1977 it was 7.1 percent).

A not-always rational departmental-command system for distributing resources has had an influence on both the republic's economic ties and the development of its dynamics. On several occasions production imported into the republic has been more expensive only because of the large cost of transporting it (for example, from the Urals, the southern Ukraine, etc.) But the available data does not demonstrate the effectiveness of economic ties, although there is some evidence, when production from the republic's enterprises being sold at a loss even on the world market.

Under the conditions of economic independence in the republic it will be necessary to pay the utmost attention to the effectiveness of its economic ties.

Ukrainian Association to Promote Regional Development Formed

904A0192A Kiev RADYANSKA UKRAYINA in Ukrainian 18 Jan 90 p 4

[Article by L. Brovchenko, Kiev: "Many Questions Will No Longer Arise"]

[Text] **The Ukrregion Association to promote regional economic development has been formed in the Ukraine**

* * *

How should an oblast development plan be drawn up in conditions of regional economic accountability? How

can an oblast's population be better provided with goods and services with the existing economy infrastructure? Where can personnel receive training for operation in conditions of economic accountability? Today these and many other questions are of concern as never before to people in production, economists, people in management, Soviet and party officials.

The Ukrregion Association sets for itself the task of giving practical assistance in development of the economy and social domain of regions within the republic, of exercising scientific-methodological guidance, of providing consultation and coordinating activities pertaining to converting regions and enterprises over to economic independence, of providing them with the requisite methods literature and documentation, of giving assistance in adopting individual elements of economic accountability, etc.

The founders of the new association include the following: UkSSR Gosplan Scientific Research Economics Institute; the main planning and economic administrations of the Ternopol, Transcarpathian, Chernigov, Zhitomir, Rovno, and Cherkassy oblast executive committees and the Kiev City Executive Committee; the Lvov department of the UkSSR Academy of Sciences Institute of Economics; the Arsenal Plant Production Association; the rayon executive committee of Kiev's Pecherskiy Rayon; the republic capital's Union of Members of Cooperatives; the community territorial self-government council of the town of Boyarka.

Information on the association's activities can be obtained from the UkSSR Gosplan Scientific Research Economics Institute (Kiev). Telephone: 296-95-03 and 269-59-98.

RESOURCE UTILIZATION SUPPLY

Gossnab Official On Changing Central Supply System

904A0155A Moscow EKONOMIKA I ZHIZN in Russian No 3, Jan 90 p 4

[Article by S. Anisimov, deputy chairman of USSR Gossnab: "From Distribution—To Trade: How to Organize the Market for Means of Production"]

[Text] The economic methods of management are persistently demanding the creation of socialist market relationships. An important part of the socialist market, as is known, is the market for means of production. Free access to material resources, which must replace the stern system of centralized distribution of products—this is not only a question having to do with the economic independence of enterprises and the development of their initiative, but in the final analysis it also represents a most important condition for achieving success in the economic reform on the whole. The question concerning the market aroused heated debates during a session of the Supreme Soviet and during the course of work carried out during the 2d Congress of People's Deputies of the USSR. Opinions were shared during discussion of the government's economic program. Common sense prevailed during the step by step conversion over to market relationships.

What is the situation with regard to the creation of a market for products of a production-technical nature? What difficulties are appearing? These matters are discussed in this article.

Initial Positions

Since the beginning of the reform, measures have been undertaken aimed at expanding the volumes of products delivered for free sales and for wholesale trade through logistical support organizations.

By 1988, the number of enterprises and organizations engaged in purchasing material resources in the form of commercial wholesale trade, through logistical support organs, had reached 16,000. The volumes of such trade in centrally distributed products was estimated to be 10 billion rubles in 1987 and in 1988 these volumes increased to 21.2 billion rubles. Moreover, in accordance with the results for this present year, they should amount to 40-50 billions of rubles. The sale of one half of these volumes will take place with the participation of the territorial organs of USSR Gossnab.

At the present time, USSR Gossnab, jointly with USSR Gosplan and ministries and departments, has fully turned over approximately 8,000 types of goods of a production nature for sale on the free market. Taking into account those products sold independently by enterprises and production cooperatives over and above the volumes for the state order and the consumption limits and also the sale of materials not used in production, the sphere of free market sales of means of production in 1989 will total, according to our calculations, 60-70 billion rubles of the 320 billion which were distributed earlier through the USSR Gossnab system.

During 1988, commerical-information centers were created in each territorial organ by USSR Gossnab. An all-union commercial-information center for accumulating data at the national economic level is in operation at the Main Computer Center of USSR Gossnab.

In view of consumer demand, a network of service centers, departments and sectors for the preparation of products for industrial consumption is undergoing further expansion. During 9 months of this year alone, more than 1 million tons of ferrous metals, almost 500,000 tons of paper products and in excess of 125,000 kilometers of cable products were prepared. Points for the rental of technical equipment have been created in each territorial organ. A network of supply-marketing cooperatives has been created and the system of cooperatives for the processing of secondary resources has undergone further development. Seventeen national and 84 regional fairs were held during the first 6 months of last year.

All of these elements concerned with restructuring the operations of USSR Gossnab are laying the foundation for further developing and improving the system of supply and they are serving as a type of transitional model for the market trade. At the same time, the search for new approaches has encountered definite difficulties.

The Chain Is No Stronger Than Its Weakest Link

The market wholesale trade is viewed by many specialists, managers and leaders apart from the overall economic mechanism. They see it as a type of "hide-and-seek" game that is capable of solving logistical support problems. Meanwhile, the market trade in products of a production-technical nature is only an element of the new economic mechanism, involving direct relationships between the producers and consumers. The shortcomings in its development are closely associated with and conditioned by shortcomings in the overall economic mechanism. If the entire market is deformed, then its elements are also.

For example, with the introduction of free sales of products (and indeed this is only the initial stage), a sharp differentiation has taken place among consumers in the degree of satisfaction of their resource requirements. Under the conditions imposed by a deficit market and monopolistic production structure, large enterprises engaged in the production of serially produced products of a general technical nature and for which there is great demand realize advantages.

And conversely, small and average size enterprises with unstable requirements and economic relationships, large enterprises engaged in the production of products for private use and new equipment and also construction organizations find themselves in difficult situations. In the case of the latter, the requirements for material resources often change in connection with the specific nature of the production operations.

The territorial organs of USSR Gossnab are experiencing great difficulties in connection with the drawing up of agreements for product deliveries within the framework of additional requirements that arise, since the producers prefer to exchange their products for goods that are profitable for them.

In addition, a general surplus of cash funds at the disposal of enterprises encourages a corresponding degree of unsatisfied demand for products of a production-technical nature. As a result, the overwhelming proportion of such products has become deficit in nature.

On the whole, it can be stated today that logistical support for the principal bulk of consumers has become complicated. However, it can be stated beyond any doubt that the principal cause here is not the organization of the market wholesale trade as such, but rather it has to do with the inconsistent and incomplete realization of all elements of the economic reform. Indeed, during these same years success was not achieved in simultaneously carrying out the reform in price formation and in the credit-financial system. The drop in the purchasing power of cash funds was conditioned by a trend towards naturalization of economic relationships.

In view of the existing situation, a further weakening of the centralized distribution of resources and its replacement by a market for means of production must in our opinion be carried out gradually in two directions. This is called for specifically in the government's economic program, approved during the 2d USSR Congress of People's Deputies.

During the 1991-1992 period, we must refrain from a further transfer of products over to free sales on the basis of direct relationships. The only exception could be those products for which supply and demand are completely balanced. In the face of critically short products that have been turned over for free sale, a need exists either for returning to centralized distribution or carrying out full volume purchases of the products for USSR Gossnab, for further sale taking into account the need for satisfying the priority requirements of the national economy.

In connection with terminating the distribution of these critically short products, in a volume of 100 billion rubles and in accordance with the consumption limits, a recommendation has been made, commencing in 1991, to include these products in the state order prior to 1992 and to transfer them over to USSR Gossnab for distribution to the territorial organs and for deliveries to consumers in the form of wholesale trade. A portion of these products, in a volume of 10-20 billion rubles' worth, could be turned over to the producers for free sale, with deliveries carried out through intermediary organizations.

As a financial-trade balance is achieved, it will obviously be necessary to continue to transfer commodity groups (preferably commencing in 1993) to free sale, such that by the year 1995 two thirds of the products will remain in the state order and centralized distribution. In such an instance, the volumes of inter and intra-branch cooperation and a definite amount of the products produced by newly created concerns, MGO's [Moscow city branches], cooperatives, unions and other associations will be included in the sphere of market turnover. The overall volume of market trade will reach approximately 300 billion rubles.

Under conditions in which demand exceeds supply, it will be necessary to introduce officially a system of priorities when concluding agreements for freely sold products. This can and must include, for example, the carrying out of state orders. In order to counter monopolism, dictates and blackmail, a system should ideally be established in which contracts for the delivery of products for free sale must be concluded with mandatory mediation by the territorial organs of USSR Gossnab or at wholesale fairs. An exception could be only those

consumers who were granted the right to operate on the basis of direct relationships.

Under present conditions, it is difficult to exaggerate the role played by the Commerical Bank of USSR Gossnab. Its task—to stimulate by its actions an expansion in the production of goods which are in short supply, the creation of an efficient and effective marketing system and the introduction of the achievements of scientific-technical progress into warehousing services.

Allow me now to discuss the future. The 13th Five-Year Plan calls for further development of the infrastructure of the market and marketing trade for means of production. More than 20 zonal wholesale trade centers and centers for marketing studies will be created. The network of departments for the preparation of products for production consumption and service centers will be expanded. Compared to 1990, the volume of services of a productive nature will increase by a factor of 1.6 and the rental of technical equipment—by fourfold.

Will new organizational forms appear? Beyond any doubt. Cost accounting organs for logistical support and marketing attached to the MGO and concerns and combined firms on a joint stock basis will be created. The same territorial organs of USSR Gossnab and the MGO and the concerns themselves will be the founders. Finally, work will continue aimed at strengthening the commercial-information centers of Gossnab, which today are an important element of the market for means of production. And they will serve as the base for the creation of an association which will include the centers of various ministries and departments.

AGRO-ECONOMICS, POLICY, ORGANIZATION

Pricing, Financing Problems in the Agro-Industrial Complex

Prices, Availability, Hungarian Experience

904B0103A Alma-Ata FREUNDSCHAFT in German 2 Dec 89 p 2

[Article by Prof Bajan Kaimow, doctor of economic sciences: "The Price-Support System: On Some Aspects of the Problem of Prices and Finances in the Agro-Industrial Complex"]

[Text]

What Remains Hidden to the Consumer

It is generally known that the problems of prices, finances and credits are very closely related and form a unified economic mechanism. Hence the complexity and urgency of the named problem in the transition of the enterprises and organizations to full economic accountability and self-financing.

Regardless of that, the financial system and state budget must now ensure economic accountability in the kolkhozes, sovkhozes, procurement and processing enterprises instead of the deep-rooted and widespread redistributive relations, where the systematic price-setting in the economic mechanism was replaced by subsidies and support money for the immediate producers.

Such work takes place under stable retail prices for the most important kinds of consumer goods, under changing production conditions and with the defective economic mechanism in the agro-industrial complex.

At the same time, the interrelationships between industry and agriculture will also be expanded and strengthened in the future. But it is precisely in agriculture where the rate of development of expanded reproduction depends upon the economically justified price level.

In this connection, the guaranteeing of an expanded reproduction in agriculture also affects the area of financial and credit relations, which go beyond the limits of the immediate economic relations of the kolkhozes and sovkhozes with the procurement and processing enterprises. That is of particular importance precisely now, when they have already gone over to the new system of the economic mechanism.

The existing price system is in need of radical reform. Numerous artificial elements, contradictions and excesses have accumulated in it that stand in the way of the development of agriculture on a sound economic basis.

Thus the analysis of the level of retail prices for the most important kinds of consumer goods shows that the state sells them to the consumers with a substantial deviation of the prices from the value of the products and from the socially necessary outlay for their production. The outlay for purchasing, transport, processing and sale of a kilogram of beef to the population amounts to 5.37 rubles but the retail price averages 1.77 rubles; the respective prices are 4.79 and 1.50 rubles for mutton and 8.41 and 3.38 rubles for butter. This is also characteristic for pork, milk and vegetables as well as some kinds of pot barley, bread and baked goods.

The price level for agricultural products is presently like a big ship whose visible part represents retail prices but all of the production costs form the invisible underwater part and remain hidden to the consumer through the complex system of redistributive relations.

Means to Stop the Rise in Costs

In our country, the elaboration and setting of the price level for agricultural products foresees the necessity of stimulating the increase in their production. For this purpose, the purchase prices for agricultural products were differentiated by price zones (in our country, for example, there are 110 price zones for milk and 132 for wheat), with the help of which the rent is taken away from the better situated agricultural enterprises.

The basis for such a system is the register of the purchase prices of the State Commitee for Prices of the USSR, which sets the base prices for all kinds of agricultural products. In addition to the base prices, markups are also foreseen for exceeding the plan, for produced output beyond the annual average of the preceding planning period, for quality improvement and for unprofitable and losing agricultural enterprises. So the individual outlays of almost every single agricultural enterprise are reflectd in the purchase price with markups.

It is apparent from this alone that the process of price-setting is not economic but administrative in nature. Moreover, the existing price-setting mechanism for agricultural products is aimed at covering the rising production costs. Thus, the level of the purchase prices was raised by 33 percent in the last 10 years for grain crops, 106 percent for potatoes, 103 percent for milk and 49 percent for beef. In the same period, the increase in the production costs was 39, 78, 56 and 55 pecent, respectively.

It is thus clear that the greatest and most significant shortcoming of the price-setting mechanism is found in the independence of prices from the volume of production and from the supply of products.

According to calculations by specialists from the Institute for Economics and Scientific-Technical Forecasting of the USSR Academy of Sciences, the increasing costs of agricultural production occur for the following reasons: in plant production—19 percent because of increasing wages, 29 percent because of raising prices for resources and 52 percent because of the increasing resource intensity. In animal production, the respective percentages are 19, 49 and 32 percent (about 50 percent of the cost structure in animal production is accounted for by feedstuffs, whose quantity has long since ceased to increase for the care of the

animals). The increase in outlays results primarily from the uneconomical use of resources.

It follows that there are real possibilities for the reduction of outlays in agriculture, especially since we are now seeing an oversaturation of agriculture with, for example, harvester combines, mineral fertilizers, etc. The main reason for the increase in production costs in agriculture is the inefficient economic mechanism, a component of which is the cost-intensive price-setting. Prices have actually become a means to fix the increase in production costs. One must give back to prices the function of being the systematic regulator of production management. To achieve this objective, it would be especially important to establish a wholesale market for agricultural products.

The Hungarian experiences in regulating the market with the help of price instruments are quite instructive. In Hungary, agricultural enterprises have been freed from obligatory deliveries since 1968. They thereby apply a tripartite price system: state, free and interval prices. At the present time, 50, 40 and 10 percent of the agricultural products are being sold with the help of these prices, respectively. That makes it possible, on the one hand, to establish the market basis for the prices and, on the other hand, it permits the regulation of agricultural production with the state prices.

The central authorities work out the state order amounting to at most 25 to 30 percent of the necessary product quantity and distribute it among the agricultural enterprises on a voluntary competitive basis. The set prices apply for this part and for a portion of the remaining products. Their change indicates to the agricultural enterprises an additional need or, on the contrary, the saturation of the market with certain products. A significant part of the products, especially those that do not require large investments, are sold at free prices.

Our country has the necessary conditions for the development of the market for agricultural products. There is no monopoly of the agricultural enterprises and they have far-reaching rights for the sale of their products and for the determination of the volume of their production according to varieties and crops. All of this makes possible a direct activation of the market relations in the branch and a better justification of the prices.

Facing Rising Costs

904B0103B Alma-Ata FREUNDSCHAFT in German 5 Dec 89 p 2

[Article by Prof Bajan Kaimow, doctor of economic sciences: "The Price-Support System: On Some Aspects of the Prices and Finances in the Agro-Industrial Complex"]

[Text]

Double Prices

Starting 1 July 1967 through the beginning of this year, the industrial prices for tractors, farm machines, spare parts, mineral fertilizers and some other industrial goods were raised several times. That naturally caused an increase in the production costs of agricultural products as well as a reduction of accumulation funds in the agricultural enterprises and a greater requirement for sources for investment financing. In this connection, a mechanism was applied to compensate for the losses inflicted on agriculture. The compensation for the price difference for farm machinery and mineral fertilizers was through the budget, just as in the compensation for the price difference in the purchase of agricultural products. The supply institutions sell the farm machinery and mineral fertilizers to the kolkhozes and sovkhozes at factory prices, even though they purchase these items at industry delivery prices. Thus the state has established two price levels for the industrial products to be sold to agriculture. Let us take, for example, the "Belarus" tractor MTS 80. Its factory price for the industry is 4,580 rubles. This is precisely what a factory or building trust must pay for it if it wants to buy a tractor for its own needs. On the other hand, the state sells such a "Belarus" tractor to agriculture for 3,987 rubles. Here is another example: the total value of a "Don 1500" harvest combine is 38,000 rubles but the kolkhozes and sovkhozes purchased it for 12,500 rubles.

Agriculture also gets electric power at a reduced rate, which produces a loss for power enterprises. There were reduced prices for natural gas, mineral fertilizers and mixed feed. The agricultural enterprises get irrigation water free of charge.

At the beginning of 1988, then, the percentage share of the compensation of the differential for farm machinery relative to the level of the industry delivery prices reached 29.1 for tractors and trailers, 12.2 for motor vehicles and trailers, 37.6 for farm machinery, 18.8 for machinery for livestock farms and 48 for mineral fertilizers. This difference constitutes the credit indebtedness of the supply institutions to the bank. It is paid off centrally by the USSR State Committee for the Agricultural Industry through budgetary allocations that are foreseen in its balance of receipts and expenditures.

Hence the state itself must answer for the losses. And they are substantial. Thus, last year more than 73 billion rubles in subsidies were appropriated from the state budget to compensate for the difference between the outlays of the state and the individual prices for agricultural products as well as for the delivery of machinery and mineral fertilizers under preferential conditions. By way of comparison: in 1988, about 34 billion rubles were expended from all financial sources in the country for the construction of housing, that is, only half as much as the appropriated state subsidies.

Contemptible Behavior

In my opinion, the main reason for the excesses in price-setting is that, under the old method of management in agriculture, in the procurement of agricultural

products it was determined for every agricultural enterprise how much it was supposed to sell to the state and hence what quantities of potatoes, meat, grain and other products it had to produce. It was frequently even dictated where and what the agricultural enterprise was supposed to sow and when and how it must bring in the harvest. Naturally all outlays must be reimbursed to the kolkhozes and sovkhozes and profits guaranteed for development under the actually existing but by no means optimum conditions. In addition, the need for foodstuffs dictated the expansion of the sown areas, likewise by no means under the best of conditions. The outlays for the intensification of production are considerable. One certainly ought not to take from nature endlessly and not invest anything in it. For that only results in exhaustion. The entire systems of supports in the form of subsidies and reduced prices has its origin in this. The subsidies had to be increased with the expansion of the production of foodstuffs.

The prices in the shops for foodstuffs remained stable in recent decades precisely because of these subsidies, although the purchase prices for agricultural products increased by a factor of 4.6, including by a factor of 5.6 for animal products. More than that, the new increased industry delivery prices for farm machinery and mineral fertilizers that were set in the years 1967 through 1986 did not extend to the agrarian sector. In my opinion, a truly stable self-regulating equivalence under the conditions of a double price level for farm machinery, mineral fertilizers and other industrial products can hardly be achieved for the countryside. The excesses in the case of prices contribute to the rise of a paradoxical situation in which the actual size of the expenditures of the society for the production of machines for the consumer has practically no significance.

With a double price level, the state actually takes funds from the efficiently operating enterprises—whereby it impairs their interests—to compensate for the difference between the industry delivery price and the price for which the products are sold to the kolkhozes and sovkhozes. This difference amounts to dozens of billions of rubles from the budget.

The double price level for the industrial products for agriculture has already been eliminated. The kolkhozes and sovkhozes are currently buying mineral fertilizers, farm machinery and other equipment at uniform industry delivery prices. They will likewise pay for electrical and thermal energy as well as natural gas under the uniform rate for industrial and agricultural enterprises.

The agricultural enterprises will also have to pay for irrigation water. These and other measures will establish the conditions for a rational use of the water and for a more efficient use of the funds that the state invests for land reclamation and other areas of production in the agrarian sector.

The prices that have been set for the new kinds of farm equipment are attaining special significance in the context of the problems to be discussed. They are determined taking into account the economic effect that is achieved through the replacement of obsolete equipment. The new price is set within the price limit calculated by the contracting authority for the producer in the elaboration of the technical normative documents. It is thereby especially important that the size of the economic effect is checked by the contracting authority during the operation and use of the new equipment. Agreed prices are introduced for a period of 2 years. The contracting authority is granted the right to lower the price in case the economic effect does not prove out in practical use or turns out to be lower than expected.

The kolkhozes and sovkhozes make only inadequate use of these economic rights granted them. If the equipment does not meet the requirements of the standard and the technical specifications, 20 percent of the price must be collected from the supplier as a fine for the benefit of the agricultural enterprise. In fact, however, the agricultural enterprises make no use of this right.

New approaches are presently being developed for the setting of prices for agricultural products. One should thereby promote the purchase of the most important kinds of agricultural products under the most favorable production conditions. Through the prices, the state will contribute to the development of large-scale specialized production of grains for bread and fodder, technical crops, meat, milk and other products. In accordance with the "Law on Cooperation in the USSR," the prices for the products in the main production of plant cultivation in every zone must cover the production costs and ensure a net profit that is necessary for the expanded reproduction, including for agricultural enterprises with relatively unfavorable natural and climatic conditions. In so doing, one will not consider the outlays having to do with the low level of management.

The examination of the purchase and wholesale prices will bring the economic interests of the partners closer together and increase the efficiency of industrial production while maintaining the price parity between agriculture and industry. And that requires a balanced and objective analysis of the problems.

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Agricultural Administration Needs Discussed in Ural Region Journal

Cooperatives Require Fewer, but Skilled Managers

904B0151A Sverdlovsk URALSKIYE NIVY in Russian No 10, Oct 89 pp 4-6

[Article by Yu. Nagayev, leading scientific associate of the Institute of Economics, Urals Division, USSR Academy of Sciences, and RSFSR meritorious economist, and A. Zhuravlev, senior research associate: "Enterprises of a New Type"]

[Text] At present, an adequate legal foundation has been provided for setting up enterprises of a new type—unions of cooperatives. The Zybino Sovkhoz [state farm] in Yasnogorskiy Rayon, Tula Oblast, was one of the first state agricultural enterprises to make a transition to the new structure. A general meeting of the collective of lessees is the supreme organ here.

Primary cooperatives of lessees attached to crop farming, animal husbandry, mechanization, power facilities, and construction divisions have become the main production units in the sovkhoz. Within the primary collectives, cells have been established—collective, family, and individual contracts on the basis of leasing. For example, in the animal husbandry cooperative 17 groups of lessees have been set up for milk production, six groups for breeding pedigree young cattle, as well as teams for finishing cattle and piglets, and a repair team. In addition, 250 families leasing young cattle for fattening are directly involved with the cattle-breeding cooperative.

Brigades for producing green and grain fodder have been organized in the crop-farming cooperative. Three teams for growing potatoes and other row crops also belong to it. Eighteen individual lessees of motor vehicles and 20 lessees servicing machinery work in the cooperative of the mechanization division. The power facilities cooperative consists of five teams, and the construction cooperative of four.

The primary cooperatives and the small contract subdivisions belonging to them are independent labor collectives. This is why the functions of their managers are very different from the ones which they used to perform under the old, conventional division-based system of management.

A new organizational-production structure is in effect in the kolkhoz [collective farm] Druzhba of Karlovskiy Rayon, Poltavskaya Oblast where a meeting of delegates of primary production and service cooperatives is the supreme management organ. The board to which a coordination center reports is subordinated to the meeting. In the center, specialists are concentrated who help the cooperatives at their request on a contractual basis. At the same time, a finance and settlement center is in operation which performs the functions of bookkeeping, analysis, and processing of monetary operations.

The primary cooperatives are the main production units. There are five of them in crop farming, four for the two main crop rotation schemes and one for the green conveyer. In animal husbandry, two cooperatives are involved in milk production, one in poultry farming, and one in sheep breeding. The "technical service" cooperative ensures the proper operation of machinery and equipment. In the construction cooperatives, lease sections for wall elements, concrete and wood products, and repairs have been organized.

The labor of lessees is paid for from the revenue generated under economic accountability which is the main incentive for increasing the output of products, improving their quality, and reducing costs. Economic relations between individual cooperatives are based on contracts and mutual financial settlements. We should note that the subdivisions have no daily work orders and protracted meetings. The positions of registrars, section agronomists, brigade leaders, and section heads have been eliminated. The cooperatives have leased arable land, meadows, pasture land, farms, and other buildings and structures, machinery. Previously, 56 tractors in crop farming were serviced by about 100 operators. At present, cooperative lessees make do with 22 tractors which are given to 45 operators with comprehensive skills.

Various forms of lease contracts (collective, family, individual) have developed at industrial and agricultural enterprises of the Urals Economic Region. However, at an absolute majority of enterprises lease contracts have only been introduced in some subdivisions within the organization. In other brigades, shops, or teams everything remains as it used to be. This brings about conflicts, and sometimes even the dissolution of a contractual relationships between the lessees and the lessor. On occasion, the work of lessees is disrupted which results in great financial losses because someone secretly sabotages implements and other means of production. In addition, in the course of such piecemeal introduction of lease contracts optimal, or at least rational, size of primary labor collectives is not evaluated and, consequently, neither is the optimal number of contracting subdivisions. A comprehensive and balanced enterprise (farm) cannot be put together with random components selected in an unfounded manner.

We believe that various kinds of new enterprises may be created under different natural conditions even within the boundaries of one administrative area. All that is necessary is to figure out the existing situation having considered all the structures possible for the area and having selected the optimal one.

The main goal of the transition to new organizational and production structures in the sovkhozes and kolkhozes is to create a union of cooperatives as the supreme form of contract leasing. The main distinction is that the enterprises of a new type are based on primary production, agricultural and service cooperatives which replace previous or newly created intrafarm subdivisions. Brigades, teams, production sections, farms, and divisions are transformed into primary production agricultural cooperatives.

The administrative and management personnel and the staff of specialists in a kolkhoz or sovkhoz are perceptibly reduced. At the same time, service cooperatives are created which do contract work for for the primary production, agricultural cooperatives. It is feasible for a majority of specialists to go to primary cooperatives and head them in the course of a transition to the enterprise of a new type.

Proceeding from the main goal of switching to the new organizational and production structures, preparatory

work is done in the process of which more partial and narrow tasks and goals are set:

—specifying the long-range specialization of a sovkhoz (kolkhoz), determining the main (leading) and other branches of agriculture, industrial production, auxiliary enterprises, and crafts. This is priority work because the introduction of leasing and lease relations is envisaged for a long period of time. If this issue is not resolved properly changes in the specialization of production in the future may bring about a violation of contractual obligation or even a revision of the entire contract;

—specifying distribution and specialization within the farm, in divisions, production sections, and comprehensive brigades taking into account their development in the long run and their transformation into primary production and service cooperatives;

—determining the size and number of production and service cooperatives within the entire farm, revising existing crop rotations, and substantiating new ones; calculating the execution of the entire necessary volume of agricultural and other work by the newly formed intrafarm divisions in keeping with the methods of operational (current) planning; determining the annual level of employment of workers in each cooperative; calculating the coefficient of self-reliance of a primary labor collective;

—specifying the size and number of production and service collectives;

—determining the necessary amount of fixed and working production assets for the operation of each of the new intrafarm production subdivision;

—evaluating the need and potential for new construction, expansion, remodeling, and retooling of production facilities, and building housing, as well as social and cultural facilities for the next 2 to 3 years, or 5 years;

—developing basic provisions, a charter, contracts, and other reporting and planning documentation needed; calculating lease fees and intrafarm prices for the products manufactured and delivered;

—drafting the chart of a new organizational and production structure of the farm and a production management chart;

—announcing the competitive staffing of vacant positions of the heads of primary production and service cooperatives; administering the competition and elections of the heads of all subdivisions by labor collectives ;

—signing outside and intra-farm contracts for producing and delivering products and servicing production;

—drawing up annual and current (working) plans in all leasing subdivisions within the farm, reviewing and resolving social issues and those of services;

There may be several forms of organizational and production structures of the enterprises of a new type. In our opinion, the territorial type of primary production cooperatives is promising. Usually, such a collective numbers several dozen people, sometimes more. It leases the land, structures, and machinery from a cooperative enterprise. Within the primary cooperatives, small leasing subdivisions consisting of 5 to 7 persons are organized.

The primary production cooperatives are mini-farms within sovkhozes and kolkhozes. Simultaneously, servicing cooperatives are created for mechanization and implement repairs, power facilities, construction and building repairs, transportation support, product sales, material and technical supply, scientific-technical support by specialist-consultants, housing and communal facilities, and so on.

The number and structure of primary production and service cooperatives are established in keeping with the specialization of a particular farm, its natural and economic conditions. No rouutine pattern can be applied in this matter. Cooperatives sign contracts not only with the farm of which they are a part but also among themselves, as well as with other enterprises and organizations, if necessary.

Apart from the territorial type of primary production cooperatives set up in a particular locality (a village, rural locality, or settlement), they may be organized in branches where a shop-based management system has been introduced. Within primary crop farming and animal husbandry cooperatives, small contract subdivisions numbering five to seven people are created. This is the second form of the enterprises of a new type which will, just as the first form does, depend on local conditions and peculiarities.

Primary cooperatives may be not only narrowly specialized but also comprehensive or, in other words, universal, combining the production of animal husbandry output with growing and procuring fodder. In comprehensive cooperatives, all workers become interested in working to secure final products.

The third form of a union of cooperatives under which primary production cooperatives are organized in small contract subdivisions is being tested on an experimental basis in the sovkhoz Krutishinskiy, Novosibirsk Oblast.

All existing organizational and production structures are characterized by large numbers of managerial personnel and high farm-wide and production branch-wide overhead. Many functions which in theory are included in the official job description of particular specialists are not performed or performed in part because they are not necessary.

A review of foreign experience reveals that under the farmer type of economic operations such management employees are absent whereas the results of production are considerably better there than in a majority of our sovkhozes and kolkhozes. This fact alone makes it possible to draw the conclusion that the management staff at agricultural and industrial enterprises of the agroindustrial complex can be reduced by changing organizational and production structures.

Most specialists working in the management apparatus of a sovkhoz (kolkhoz) and sitting behind a desk in the office are actually removed from production which, as everyone knows well, is concentrated in subordinate subdivisions where direct human labor is combined with the means of production. Managers of intrafarm subdivisions run their operation independently and virtually do not need any permanent pointers and instructions if they are knowledgeable specialists and have organizational talent and experience. It is not only unfeasible but also harmful to supplant subdivision managers and "breathe down their necks" all the time because this blunts their initiative, encourages irresponsibility, and in general disrupts work.

An analysis shows that a knowledgeable and experienced specialist-organizer should be the chairman of a primary cooperative. This is why it is feasible for a considerable share of the management staff to go to work for primary cooperatives set up in intrafarm subdivisions. Over there, they come into their own as specialists and make considerably better money.

The main advantage of the enterprises of a new type is found in the fact that toilers indeed become genuine masters. This makes it possible to boost labor productivity and increase output with the lowest possible specific investment of labor and funds, that is, with a lower self-cost of the products turned out.

UDC 631.1

How Much Managerial, Specialist Support Required?

904B0151B Sverdlovsk URALSKIY NIVY in Russian No 12, Dec 89 pp 4-6

[Article by Yu. Nagayev, head scientific worker of the Economics Institute of UrO [Urals department] of the USSR AS [Academy of Sciences], candidate of economic sciences and meritorious economist of the RSFSR and by A. Zhuravlev, senior scientific worker. Conducted by A. L. Pustuyev, senior scientific worker of the UrO Institute of Economics of USSR AS: "The Order of the Times"]

[Text] For every 100 individuals working in agricultural production in the Urals there are 14 managers. In other words, under the existing organizational-production structure of enterprises one person manages seven workers. With a consideration of the rayon and oblast links the number of managers decreases to five—without the freed people in public organizations. No other country has such non-production expenditures.

As we know, in production management we have an overlapping of functions and multiple phases. By the time a managerial decision reaches the work place it often has lost its meaning and sometimes even contradicts good common sense. Experience shows that a significant portion of instructions for directors and specialists are not implemented because they can be done without.

We have carried out calculations on the capital investments needed to provide management and service personnel in state enterprises and kolkhozes of the Urals Economic Region with well-organized one and two-family houses. These investments comprise a minimum of 1.7 billion rubles, not considering expenditures for the building of housing for workers who are directly involved in production. This kind of investment and its assimilation in coming years is not realistic. If we curtail management personnel we can decrease not only production costs but also the need for capital investments for housing.

New organizational-production structures of enterprises based on the development of primary agricultural and service cooperatives with long-term leased land and fixed production capital enable us to function with a relatively-small managerial staff while at the same time significantly increasing production effectiveness and labor productivity.

In the late 1960's it was noted that in Kazakhstan's Akchi Sovkhoz, an experimental enterprise near Alma-Ata, as compared to other sovkhozes the production cost of grain was less by a factor of 4, profits per worker were higher by a factor of 7 and wages of workers were greater by a factor of 4. The average wage here comprised 360 rubles per month. At the same time in the enterprise as a whole capital expended for wages was less by a factor of 2.4 than initially planned in the annual production-financial plan. This means that over half the money released for wages remained in the account of the enterprise while there was an actual overfulfillment of all plan indicators.

The results of the economic operations of the experimental enterprise were in their time noted by the Kazakh SSR Ministry of Agriculture. How was all of this achieved?

An analysis showed that the same tractors and combines worked in this sovkhoz as in other enterprises. There was no more equipment per unit area than anywhere else. The enterprise organized six field subdivisions, which in their operations were similar to contemporary primary farming cooperatives although they were not called that then. Service subdivisions were created: material-technical supply; commercial (its function—to procure seed and fertilizer, to bring up to condition and sell to

the state the harvest that was raised by the field subdivisions); general nutrition; administrative-coordinational. All subdivisions were paid according to the end product. Trained specialists headed the subdivisions.

In Akchi Sovkhoz management personnel was reduced to a minimum. Management consisted of two people: director Mikhail Vasilyevich Li and bookkeeper-economist Ivan Nikiforovich Khudenko. They were called the coordinating link, which implemented outside contacts with supply organs, with rayon and oblast organizations, with ministries and so on. To a lesser degree the coordinating link was involved in internal distribution-management activities because here the system managed itself.

Every intraenterprise subdivision had a skilfully and precisely worked-out technological chart that was the basic document-plan (assignment). The chart included how many and what kinds of jobs had to be carried out, within what time frame and how much labor and capital (seed, fuel, ongoing repairs, amortization and so forth) would have to be invested in order to obtain a certain quantity of production. There was an additional payment for above-plan yields.

It should be noted that expenditures were calculated for the development of technological charts, and for other plan and program documents, including for the programming of harvests. It was learned that that it is much cheaper for the enterprise to contract out for this work with a group of scientific workers or a brigade of rayon specialists than to maintain a staff of sovkhoz specialists-managers for the entire calendar year. The control functions of the latter in the given production system were absolutely unnecessary because self-control was implemented and everyone worked for the end result. The system flexibly connected labor and the harvest into an indivisible whole in the mind of every worker for it was necessary to strive to an equal degree to increase productivity and to economize in labor. Here you had to think for yourself within your own subdivision even though your technological chart contained progressive production techniques.

Consequently, we can draw the conclusion that in the given enterprise under socialist production conditions the farmer method of management was utilized successfully. It is well-known that farmers do not support a management staff but achieve a high level of productivity in crops and livestock by constantly utilizing elaborations, consultations and various services provided by scientists and experienced specialists through contracts. In this case farmers scrupulously carry out the proposed technology because if the client does not the scientist relieves himself of the material responsibility for the obtained results. Akchi Sovkhoz had positive work experience for 2 years but later it became the victim of the command-bureaucratic management system. It did not submit daily reports on the fulfillment of particular operations, was unable to fill out numerous statistical reports, and did not have the opportunity to give orders or participate in the work of the rayon link or of higher-standing organizations in general. Despite the fact that the sovkhoz produced large harvests and products at a considerably lesser cost than did other enterprises, the experiment was discontinued and today is forgotten. But if we do not return again to this experiment we will never catch up to Western farmers in labor productivity. Agricultural production will remain expensive and finally retail prices will have to be increased, and perhaps without any compensation to workers.

It should be noted that there was a great deal of noise surrounding I. N. Khudenko. Not only were there attacks on him but a criminal case was even begun against him. In the opinion of the majority of specialists, it was illegal. All of I. N. Khudenko's guilt had to do with the fact that he carried out, even during those times, a relentless struggle against the administrative-command, bureaucratic management system.

In our opinion, the most important circumstance was the fact that the very idea of the experiment was forgotten in Akchi Sovkhoz; in other words, what was forgotten was the possibility under socialist conditions to sharply increase labor productivity, to decrease the production cost of agricultural products, to decrease administrative-management costs to a minimum and to considerably increase the general effectiveness of production while eliminating the cumbersome accounts that did not justify themselves.

We know that farm enterprises in the U.S., Canada, Europe and other countries do not have a cumbersome administrative-management personnel staff. However, most of the data of enterprises, which are relatively small in size, reflect a high level of effectiveness of agricultural production. Average indicators for farm enterprises of Western countries are significantly higher than those of our sovkhozes and kolkhozes. In farm enterprises who carries out the function, and how, of specialist, of whom there are dozens in each of our enterprises?

An analysis shows that many functions are devised and can be done without since they are the product of the command-administrative, bureaucratic management system. But the fulfillment of a number of functions is essential. Who fulfills them among farmers?

Let us look at a suburban farm in Canada. In 1987 Soviet journalists N. Grigoryev and V. Shelkov visited the farm of Rolf Sholten not far from Toronto, one of the largest cities in Canada. They noted that the given farm specializes in the production of labor-intensive vegetable crops—turnip-like onions and carrots. Over 40 hectares of plowland are occupied in these crops. The farmer harvests 560 quintals of onions and 840 quintals of carrots per hectare. On the farm there are only two people—the farmer himself and his son. Two seasonal workers are recruited additionally. The farm has no

specialists and no administrative-management personnel although the enterprise utilizes the most progressive technology of vegetable production and the best varieties and implements measures to combat pests and agricultural crop diseases in a timely manner and efficiently. All processes are mechanized and harvesting is carried out by combines. Six tractors differing in power and function and two combines are used in vegetable production.

As far as the farmer's house is concerned, he has three spacious sheds-barns constructed from sectional iron. One of the sheds is a garage for the self-propelled equipment, another is used as a shop and contains welding equipment, a drill and other machine tools and sets of various instruments. The third shed is a storage area for vegetables and is divided into two parts. Carrots are stored in one section and onions in the other. On the farm a part of the harvest is stored until the following harvest—carrots until May and onions until June, which is explained by the economic considerations of the owner. The vegetable storehouse is equipped with a cooling unit which maintains the temperature that is necessary to preserve the vegetables.

Vegetables are shipped from the farm to factories in square cubic meter crates, where they are washed, dried, sorted, bagged and packed. For example, carrots are packed in 900-gram plastic bags. The latter are loaded into vans and sent to stores.

Who fulfills the function of specialist on the farm? After all, the farmer himself, no matter what his level of knowledge, could not take care of all the functions. In this regard we must focus on a schedule hanging on the vegetable storehouse wall which deals with the operations data concerning the presence of pests in the fields. It is put together by a specialist from the local provincial ministry of agriculture, who twice weekly surveys the fields, determines the results and records them on the chart. When the curve reaches a certain point the farmer is given recommendations and he begins to combat the pests with the necessary agents. The specialist from the provincial center carries out this work according to an annual contract and is reimbursed accordingly. If the farmer is not satisfied with the work of this specialist the following year he contracts with another. In this way the specialist who is invited develops for the farmer a progressive technology for the production, harvesting and storage of a particular crop relative to the local soil and weather-climate conditions.

It should be noted that the tie between the farmer and specialists, without whom he cannot operate, is stable and of mutual interest since both parties attempt to have permanent clients. The special feature of such a relationship has to do with the fact that the specialist, who has been invited by contract, bears the responsibility for the technology he has developed only if the farmer has not deviated from it in any way in implementing it. Here strict discipline exists.

However, the farmer must have the necessary multifaceted knowledge and consequently, the corresponding eduction, which is confirmed by the analysis that was made. Without certain knowledge it is difficult for the farmer to deal with various specialists and to make an assessment of the work carried out by them. Farmers keep almost no accounts, which are reduced to a minimum. Earlier it was noted that even produce is not weighed but is delivered to the consumer in crates, the weight of which is known beforehand. All of this considerably decreases the expenditure of labor and resources.

A generalization of the work experience of lease subdivisions and primary agricultural cooperatives shows that their directors must have multi-faceted knowledge and be more knowledgeable than the brigades of the former regular intra-enterprise subdivisions of sovkhozes and kolkhozes. They must be not only good organizers but at the same time economists, technologists and machine operators. This is why it is desireable that at the head of the new structural subdivisions we have specialists with a higher or a secondary education, which is already the case in a number of agricultural enterprises.

The director of the primary collective (lease subdivision) should not allow all production expenditures in his subdivision, including wages, to exceed earnings for the products produced or growth of the latter at the expense of decreased soil fertility. This, unfortunately, has been noted in a number of lease relations. It is important not to forget that the land is the main means of production in agriculture and it can remain such only when used efficiently.

The training and retraining of directors of primary agricultural production cooperatives and lease links must be carried out according to the new programs which are very different from those used previously to train the middle link in sovkhozes and kolkhozes. At the present time lessons must be carried out primarily in the form of business games, i.e. through an examination of the possible specific situations which may arise in particular subdivisions. Here we can make use of the recommendations on progressive forms of organization of labor and production and of the analysis of financial results.

At the present time the words "manager" (specialist in the area of management) and "marketing" (the study and characteristics of consumers of goods produced under socialist and other conditions) are entering the economic lexicon. All of this comprises a new area of economic knowledge which must be mastered by directors not only of the higher but also of the middle link.

Lack of knowledge, or even inadequate preparation of directors of lease collectives has resulted on numerous occasions in a violation of economic interrelations and in the breaking off of previous contracts. For example, in Yuzhakovskiy Sovkhoz of Prigorodnyy Rayon, Sverdlov Oblast, leasees declared: "Even if we work a year without receiving a kopeck in advance and achieve the planned harvest, in the final analysis we will owe the sovkhoz about 5,000 rubles." Undoubtedly, at fault here are not

only the leasees but also the sovkhoz director, and especially his economic service, which often tries to deliberately decrease the income of lease labor collectives. The solution here is obvious. If at the head of the given subdivision we had a trained, educated specialist such gross mistakes would not be made in the course of concluding contracts between the sovkhoz directors and the lease link. This is why all directors of lease collectives must have the necessary level of knowledge as a mandatory condition for the successful operation of a particular subdivision.

Central Asian Academician Interviewed on Ownership, Incentives

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[Interview with S.N. Usmanov, VASKhNIL academician, director, Central Asian NII of Agricultural Economics by SELSKAYA ZHIZN correspondent V. Virkunen: "On Property: Who is to Own Nature's Gift?"; time, place not given]

[Text] **For the first time in the history of our lawmaking, not one but three draft laws on property have been put forward for general discussion. Such an approach is not coincidental. We have taken a path toward the formation of a complex and diverse property structure. This problem does not elicit simple comprehension among everyone, although it is quite obvious that the process of the democratic renewal of socialism is impossible without the transformation of property relations. Today, VASKhNIL [All-Union Academy of Agricultural Sciences imeni Lenin] Academician, Director of the Central Asian NII [scientific research institute] of Agricultural Economics S.N. Usmanov answers the questions of the SELSKAYA ZHIZN correspondent.**

[Correspondent] Saidmakhmud Nogmanovich, how do you assess the new draft?

[Usmanov] This is undoubtedly a fundamental document. The draft law is of a revolutionary nature. It creates the basis for the elimination of the toiler's alienation from the land and other means of production. It grants a person the right to be in charge of property and the results of his labor.

The innovation of the approach is defined by the need for a diversity of forms of property, not by attempts to find one universal scheme for all life's cases. The law creates an opportunity to use freely those forms of property and organization of production which correspond most specifically to concrete local conditions.

At the same time, I cannot agree unconditionally with a number of the statutes of parallel drafts of the Law on Property. In particular, this concerns the section on property on USSR land.

[Correspondent] What concretely manifests your disagreement?

[Usmanov] The earth is the source of all riches. One of its most important features is the interweaving of the economic process with the biological process. As we know, the the biological process, its intensity, is preeminent here. We are speaking of the efficacy of natural force. And, as we know, it is free. The earth's soil cover has free biological process, a free productive force, and replacing it with human labor is as impossible as replacing arshins with poods, to use Lenin's expression.

I speak of this not by coincidence. After all, a superficial approach, and a lack of profound comprehension of the essential features of property on the earth may lead to errors and incorrect decisions. **In particular, I would apply this to the draft Law statute which speaks of the transfer of land and natural resources to the property of republics and oblasts. I am convinced that this leads to negative consequences in matters of the growth of nationalism and the destruction of the basic principles of federalism in the USSR.**

We sometimes consider the gift of nature, the earth and its wealth from nationalistic positions. Since there are nations, such a tendency is maintained. This absolutely must be taken into consideration in our legislation, otherwise willy-nilly we shall begin to pander to nationalism. **Thus, it seems to me that all land in the USSR must become public property. It may not be the property of the republics. In any other case, we may reach disintegration.**

Of course, as public property, the land must be transferred to a republic in ownership. In such a case, the state, through taxation, and considering the degree of fertility, must take into the state budget the plentiful surplus product created by this fertility. It is necessary to create conditions for becoming not the master of the land, but the master on the land.

[Correspondent] What practical meaning can the removal of the surplus product into the state budget have?

[Usmanov] To this day we cannot eliminate the situation when half of our farms operate at a loss, and half operate with a profit. That is precisely because we have not learned to control this plentiful surplus product, nature's gift, or to put it simply, natural fertility. We incorrectly inventory and allocate them among farms. Everyone knows full well that the fertile, irrigated lands of Uzbekistan or the Kuban, for example, yield a harvest several times larger than that of Russia's Kalinin or Smolensk oblasts. If we compile a good, scientifically based land tax roll and start to conduct a consistent, objective price and taxation policy, then the losses will be eliminated.

For a long time we ignored this conformity with law, and through fallacious prices, artificially drove the farms into a pit of debt. In view of this, the numerous proposals for declaring unprofitable farms bankrupt appear to be

groundless. If the foodstuffs shortage is quite acutely perceived now, then what will happen to the grocery counters when the bankruptcies are eliminated?

[Correspondent] Is the history of the land question of interest for modern lawmaking?

[Usmanov] Yes, undoubtedly. After all, the issue of land has been present unchangingly in all revolutions, in all social movements. This also applies to Russia to an equal degree. It sometimes seems to us that one question or another is an original one, but alas, history has posed it before repeatedly. For example, this is what may be said regarding private property on the land. Landowners have attempted any way possible to prove that private property on the land is the most fair form of property, that it is sacred, inviolable. The peasants were against this, and justly said that the land was "God's land" or "no one's land."

The Russian peasants distinguished carefully the concepts of the owner of the land and the master on the land. In the ideological struggle with the landowner, the peasant would tell him: The owner of the land is neither you, barin, nor I; the owner of the land is the lord God. But I am the master on the land, since I cultivate it and water it with my sweat, and even my blood.

The peasants' agrarian demands, reflected in their 242 instructions in 1917 were as follows: the destruction of private property on the land; the land to public property, and equalized land use according to head counts.

The peasants' demands found their expression in the famous 26 October 1917 "Decree on Land." By the decree, the peasants received land for free and for free utilization. They were released from all colossal debts. The poor and mid-level peasants were spared the yoke of renting, and cruel servitude.

Also through the "Decree on Land," all citizens the Russian state were granted the right of free utilization of the land for cultivating it by their labor. Our Supreme Soviet should also take accumulated knowledge and historical experience into more complete consideration.

It is not a matter of disbursing the land, but one of creating people's interest in the land's effective use, just as with other means of production. That is, man must become the full and equal master not of the land, but a master on the land. The peasant must fully and equally own land, and pass it down as an inheritance, but not sell it.

[Correspondent] How would you characterize the master? Who is he, this master on the land?

[Usmanov] Their is one criterion here. He may be compared with the owner of a private farm plot. In the first place, he sows what he likes. Secondly, he sells his production where he likes, and when he likes, winter or summer—it does not matter. And thirdly, he sells it at the price he likes. Becoming a master takes place through these three elements.

Why have we not utilized until this time the potential possibilities of the kolkhozes and sovkhozes? Because the farm cannot take charge of its production; it cannot determine prices itself. Everything is determined from above. Thus, what economic accountability may we speak about here? If we speak of the diversity of forms of property and management, then it is necessary to create equal economic conditions for all, an equal attitude toward the land, property, and produced output, and an equal right in material provision.

[Correspondent] It can frequently be heard that we have no master who could effectively work on the land, that he remains to be taught. What could you say on this matter?

[Usmanov] The master exists here, and a fine one at that. Take the private farm plot. In Uzbekistan, out of 4 million hectares of irrigated, or, as we say, golden land, 200,000 are in private farm plots, comprising only 5 percent of the irrigated area. This year, these 200,000 hectares yielded 25 percent of the republic's gross agricultural production.

They are not sowing cotton, but primarily foodstuff crops. In Uzbekistan's foodstuffs complex, this 5 percent yielded 40 percent of all foodstuffs. Therefore, the Uzbek CP Central Committee and republic government is recently taking a range of measures to sharply increase production on the basis of the private farm plots. Another 200,000 hectares of irrigated land is being transferred to ownership.

We have formed in the republic the following conception of irrigated land utilization. Of the 4 million hectares, 3 million is the cotton complex. And 1 million hectares could be used more efficiently as private farm plots and peasant farms. Here there will be orchards, vineyards, melon patches and vegetable gardens. Under conditions of reduced monoculture production—cotton—the peasant [dekhkanin] will be able to produce considerably more fruits and vegetables. All that has to be done is to activate his private interest.

[Correspondent] Monocultures are, of course, a sample of administrative violence against man and the earth. But what can be done, if cotton only grows in the Central Asian republics?

[Usmanov] With rational utilization, the quantity of cotton we are producing should be more than enough. Another matter is that it is necessary to improve its quality, to turn it into an advantageous crop. For the time being, with the existing wholesale prices, it is far more advantageous to raise fruit, vegetables, and melons.

True, at the request of the Uzbek SSR, the union Government allocated additional increments to the price of cotton for 1989-1990 in the amount of R1.2 billion. This allowed a raise in the miserly wages for picking cotton. Yet the urgency of the problem has not yet abated.

A minimum income of R7,140 is required for an average peasant with a seven-member family to live. With a republic average productivity of 27 quintals, and with two full-time year-round workers, the family income is R3,458. Plus the R1,500 yielded by the private farm plot. In all, R4,956. As you can see, R2,184 below the subsistence minimum. According to USSR Goskomstat data, the income of the republic's rural toilers is 39 percent lower than the country's average. With a two-fold increase in the wholesale price of cotton, the total family income could rise to R8,412, and only then be comparable with the union-average index.

A family order is broadly applied in order to interest the peasant in growing cotton. The family takes upon itself growing cotton on 3-4 hectares. Along with this, it is granted credit, and assistance in organizing stock-breeding farms of 15-20 head of large horned stock, and provided with feed. Thus, peasant farms may be organized even within cotton cultivation. For example, over one thousand such farms are working successfully in Bukhara Oblast.

The March (1989) Plenum of the CPSU Central Committee made a political decision on the diversity of forms of property and management. Now, the political ideas have been embodied in the drafts of the Law on Property. Our common task consists of creating equal economic conditions for all producers of goods: kolkhozes, sovkhozes, cooperatives, lessees, and peasant farms, without putting the various forms of property in opposition to one another. The right to own land must also be equal among them. All of this is indisputable. However, the right to private property on the land seems unacceptable to me.

[Correspondent] Thank you for the interview.

REGIONAL DEVELOPMENT

Rebirth of Individual Farming in Estonia, Historical Perspective

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No 12, Dec 89 pp 2-5

[Article by G.A. Kaazik, journalist: "Rebirth of Peasant Family Farms in Estonia"]

[Text] In Estonia, distinct from Russia, common land utilization for practical purposes has never existed. Since time immemorial, peasants leased the land from German barons, but following the law governing peasantry (in 1856 in Estlyandskaya Province and in 1849 in Liflyandskaya Province) they began purchasing it as private property. By the end of the 19th Century, there was an overwhelming majority of such farms in southern Estonia and yet this is not meant to imply that all debts were paid.

In 1919, the Estonian Republic announced a land reform. The Myzovskiye lands of barons were expropriated and turned over to landless peasants or those possessing little land. More than 50,000 new peasant farms were created. In 1939, there were 139,400 of them in Estonia, a considerable portion of which consisted of 10 to 12 hectares of land. According to 1939 census data, they included 3,179,000 hectares of land, including 1,118,000 hectares of arable land and they satisfied the republic's requirements for food goods, for the creation of reserves and for exporting food products.

It bears mentioning that our type of agricultural settlement differs sharply from Russian villages. Each owner erected his buildings at some distance from his neighbors and on his own plot and as a rule an Estonian village is spread out over several square kilometers. Each farm has its own outlet to a country road. Modern villages and settlements of the rural type only began to be developed during the post-war period, during the period devoted to the creation of kolkhozes and sovkhozes.

In objectively evaluating the development of agricultural production in Soviet Estonia, it bears mentioning that we have not achieved those goals on our collective farms that we dreamed about earlier. The production level for milk and meat per unit of ground space in Estonia, although higher than in many other union republics, is nevertheless considerably lower than, for example, in Finland, where peasant farms are functioning.

With the collectivization of peasant farms, farming began to be supplied rapidly with modern wide-swath equipment which, in addition to indisputable pluses, also had many minus factors. In particular, as a result of the small dimensions of the tracts, those patches of land considered to be unsuited for cultivation using broad-swath machines and implements were gradually abandoned and the area of agricultural land, compared to 1939 (2.7 million hectares), declined by 1.2 million hectares or by 44 percent. The majority of these tracts became overgrown with shrubs and trees and yet many of them can still be returned to cultivation. It is only fair to admit that the natural haying and pasture lands taken into account in 1939 included many which, owing to poor soil improvement conditions, were not used as intended at the time. And yet at the present time there is much more unused or extensively used land at Estonian kolkhozes and sovkhozes. Tracts of land can be found on the farms which for decades have not been plowed or fertilized with farmyard manure.

Soil conditions are especially unfavorable in the south-eastern zone of the republic, where a hilly landscape predominates. Here the average size of a tract is less than 1 hectare. Under such conditions, large-scale agricultural production can be organized only with the aid of strong investments and even then it will be practically impossible to achieve the average republic level for yields and farmer wages. This situation is occurring frequently in a number of other regions. In former years, with use being made of non-economic administrative methods, this led to a situation in which success could not be achieved in organizing the efficient utilization of many tracts of land.

Perestroyka has forced us into taking a thrifty look at our small tracts of abandoned land. The Nymme Sovkhoz in Pyarnuskiy Rayon (director Ya. Nagel) was one of the first in the republic to propagandize the intelligent combining of small and large-scale production. It was at this farm that lessee Arved Berg worked. The sovkhoz presented Berg with an empty farmstead and initially furnished him with assistance in organizing his peasant farm. There were many who followed Berg's example. The spring plowing of 1989 was carried out on approximately 500 private peasant farms (including independent ones which operate on a lease basis). The rayispolkoms [rayon executive committees] began receiving requests for the allocation of land for the purpose of organizing peasant farms. For example, more than 100 such requests were received in the Vyruskiy rayispolkom during the month of June.

The 16 February 1989 decree of the Council of Ministers of the Estonian SSR entitled "Initial Measures for the Development of Peasant Farms" provided the legal basis for this movement. One month later, much was said during the March Plenum of the CPSU Central Committee concerning the possibility of such a method for developing agricultural production. The Estonian Council of Ministers has decreed that a peasant farm is a unit of a light form of agricultural production and that it is based upon state ownership of the land (including forests and interior water areas), the private labor of a peasant family and private ownership of the means of production. The rayispolkoms present the peasants with land for permanent (eternal) use in accordance with a state document. It is stipulated in the decree that in the event of death of the peasant, one of his heirs is authorized to reformulate the document in his name provided he continues to manage the farm.

For the first 5 years, a peasant farm is released from having to pay an agricultural tax and is subsequently authorized to receive benefits if it develops unused outlying parcels of land and produces livestock husbandry products based upon the use of internally produced feed.

A peasant family is authorized to receive state social security and work performed on a peasant farm is included in an individual's overall and continuous length of service. The members of a peasant family pay dues into the social insurance fund from their annual net income in accordance with the rates adopted for the sovkhozes.

Thus many serious problems were removed from the very beginning. But this is not meant to imply that some do not still remain. In order to solve them effectively, the peasants began to join together. Rayon peasant unions began to appear only last year and early this year a Central Union for Estonian Peasants was created. Within this union a fund was formed for additional crediting and for furnishing assistance in organizing settlement (on new lands) and experimental peasant farms. Gosagroprom [State Agro-Industrial Committee] for the Estonian SSR was one of the first to contribute to this fund.

How should a modern peasant-farmer be trained? Indeed he must possess comprehensive knowledge and in a combination which even the agricultural VUZ's cannot provide. Thus, as its first order of business, the Central Peasant Union organized courses for beginning farmers. Here the students study agronomy, animal breeding, the veterinary science, economics and a number of other disciplines. Recently, similar courses were created for future housewives in the peasant sector. These undertakings were very warmly welcomed by society.

It is very difficult to find specialists within the republic who are skilled in organizing light agricultural production and thus the peasant union decided to invite some from Finland. They read a series of lectures on the organization of peasant farms, on determining the proper size for such farms and in correctly determining the trend in production operations while taking into account business conditions, demand and so forth. It bears mentioning that the majority of independent farms in Estonia selected dairy animal husbandry as their principal production activity.

Just as during the pre-war years, the average land area for peasant farms ranges from 10-20 hectares. There are obviously exceptions to this rule. In Vyruskiy Rayon, one lessee was allocated 105 hectares of overgrown land for the raising of cattle for meat purposes. Given the conditions found in Estonia, swine husbandry offers only limited prospects for the peasant farms, since it is impossible to develop such operations in the absence of purchased mixed feed. Owing to its high cost, the use of such feed makes such operations unprofitable. Under our conditions, a peasant is not always able to produce grain for a considerable number of animals. Several peasant farms have selected seed production for vegetable crops as their specialty. This is rather profitable work: it can produce good income with use being made of only a couple of hectares of arable land.

The Finnish specialists recommended another type of peasant farm to us, one which is being employed successfully in their country—tourist farms. Actually, if such a farm is capable of providing tourists with lodging, locally produced quality food products (for example, home-baked black bread, fresh milk), souvenirs and others, then tourists can be expected not only from one's own republic but also from abroad. Certainly, this requires the organization of services at the international level. We still do not have such farms and yet I have no doubt but that they will eventually appear.

It is one thing to listen to lectures delivered by specialists and still another to see a modern peasant farm with one's own eyes. The Central Union of Peasants organized a monthly probationary period for a group of Estonian peasants in Poland, in Torunskiy Province, where our countrymen worked for 3 weeks during the spring on peasant farms, acquiring experience in effective management on small plots of land. Thus, although they had mastered it earlier, nevertheless with the passage of time

the Estonian peasants lost their touch with collectivization. Recently a group of Estonian peasants spent 3 months acquiring practical experience in Finland.

The mechanization of field operations is one of the most vital problems concerned with the organization of farming work on peasant farms. At the present time, there are 14,000 tractors in private use. But what does this mean as far as tractors are concerned? For the most part these are either home-made machines or ones that have been restored from machines that were written off at kolkhozes or sovkhozes. Understandably, the reliability of this equipment is not very high. In 1988, "Estselkhoztekhnika" sold 90 tractors and 1,100 units of towing implements and other items of equipment to peasants, the overall value of which amounted to 500,000 rubles. But certainly, this was not expected to solve the problem. There is an especially urgent need for pull-type machines and miniaturized items of equipment suitable for work on small fields. Our peasants received fine assistance from their Finnish and Swedish colleagues. For the spring sowing operations, 238 sowing machines, cultivators and plows were gathered together in Finland and turned over free of charge to our peasants. Certainly, this was only a drop in the ocean. The production of some implements is presently being organized in various regions throughout the republic and also in neighboring Latvia and Lithuania.

The kolkhozes and sovkhozes furnished some assistance to the peasant farms in carrying out the spring sowing work. It bears mentioning that Polish peasants who paid a return visit to Estonia in May placed a high value on the field work and on the condition of the crops of their Estonian colleagues. Our peasants encountered many difficulties in harvesting their crops this year. It is certainly difficult for an individual peasant to acquire a combine and a kolkhoz or sovkhoz can come to his assistance only after the harvest work has been completed on its own fields. How can this be?

The director of the "Nimme" Sovkhoz came up with a fine idea. He has recommended that the kolkhozes and sovkhozes carry out land improvement work on tracts that are located at great distances from the central farmstead and to turn them over on a lease basis or transfer them to workers desiring to manage a farm independently. That is, several peasant farms must be created at once and not just one or two, as is the case at a majority of the kolkhozes and sovkhozes. These farms will then be able to combine their forces and resources in order to acquire a combine, grain dryer or other items of costly equipment. "Estselkhoztekhnika" has no objection to selling such equipment to peasants. Six peasant farms are already in operation at the "Nimme" Sovkhoz and two of these are operating on a lease basis and looking forward to implementing such plans.

The rebirth of the peasantry and an intelligent combination of large-scale and light forms of production are raising problems not only in connection with the development of unused land but also related to changes in the very tenor of life for the rural population and improving daily routine and leisure time in the countryside. Of considerable importance is the fact that the peasants are organizing production operations on their developed lands along biological principles and in synchronization with nature. Thus the output of these farms is biologically pure and dietetic.

A great amount of work remains to be carried out in connection with the creation of a modern infrastructure for the procurement, processing, marketing and sale of the products of peasant farms. And these problems must be solved immediately, otherwise the peasant movement will exert an adverse effect on society as a whole.

The creation of peasant farms in Estonia is by no means proceeding smoothly. Quite often, individuals who have submitted requests for the allocation of land encounter a lack of understanding and at times even opposition by the leadership of the kolkhozes and sovkhozes. The leaders can be understood. An independent farm can be managed only by individuals who are conscientious, industrious, possess all-round development and who performed excellent work at a kolkhoz or sovkhoz. The land must not be entrusted to just anybody. Thus it is stipulated that an individual desiring to manage a private peasant farm must present the rayispolkom with a brief program of his activities in the financial and economic spheres. A committee consisting of representatives of the rayispolkom, RAPO [rayon agro-industrial association] and the land management service was created in Tartuskiy Rayon for the purpose of resolving disputes which arise between the leaders of kolkhozes and peasant farms. Similar committees are being created in other rayons.

Beginning peasants are encountering many problems with their construction and bank loans. The shortage in construction materials is generally well known and if anything can be acquired it is generally at a high price. And indeed the majority of beginning farmers (as a rule, these are young families or families with many children) do not have much money. Last year the opportunities for obtaining bank credit were expanded considerably and yet this year the limits for such credit have been curtailed sharply.

How much funds are needed for the creation of an efficiently operating peasant farm? Many specialists believe that not less than 100,000 rubles are needed. Given the restrictions on bank credit, where can such funds be obtained? The director of the "Munamyae" Sovkhoz in Vyruskiy Rayon, Edgar Kolts, has proposed a solution for this problem—a gradual conversion over from work in public production to private production through intermediate forms. For example, an individual who creates a private peasant farm continues to work at a sovkhoz while developing his own farm at the same time. Understandably, a beginning farm will initially encounter a considerable amount of pressure, especially during the summer. On the other hand, in the event of

failure a peasant farm can be abandoned painlessly. Indeed, not every individual is meant to be a true owner.

The "Munamyae" Sovkhoz is in a difficult economic situation and still it is not the only farm in Vyruskiy Rayon where bankruptcy is "knocking at the door." In 1987 the decision was made to make the sovkhoz's land available for the creation of private farms and yet initially there was nobody willing to take up this offer. The first owner of a peasant farm in the district, Yuri Plankhof, believes that these lands can supply the present owners with 3-4 times more milk than they are furnishing at the present time. If the production of this product is increased by only twofold, Vyruskiy Rayon could then "stand on its own two feet." The peasant movement is gradually expanding throughout the rayon. Today there are 14 private farms at the Munamyae Sovkhoz and throughout the rayon—more than 100. Their total area under crops is approximately 1% of the plowed fields in the rayon. But this is only the beginning.

As of 26 May, decisions handed down by the republic's rayispolkoms called for 11,300 hectares of land, including 6,800 hectares of agricultural land, to be allocated to 437 peasant farms. The average land area per farm is 26 hectares.

Much work is being carried out throughout the republic in connection with the creation of favorable conditions for developing the private sector in agriculture and yet many obstacles still remain in the path of this development. Given this situation, the individuals presently being drawn towards independent management must be genuine fanatics. It would appear that the spirit of their ancestors has still not been lost, individuals who worked our poor lands for thousands of years and who were moved not so much by the desire to become rich but rather by the desire to be the owners of their land. The immediate future will reveal how vital will be the peasant farms in Soviet Estonia.

POST-PROCUREMENT PROCESSING

Fruit, Vegetable Supply, Distribution in Central Asia

Supply Problems in Turkmenistan

904B0114A Ashkhabad TURKMENSKAYA ISKRA in Russian 6 Dec 89 p 2

[Article by A. Dudnichenko: "Where is the Promised Abundance?"]

[Text] Vegetable plantations have emptied. There are only a handful of enterprises in the republic which must harvest late cabbage, carrots and beets on the remaining dozens of hectares. But this harvest will not bring about a considerable correction in the plan for vegetable procurement. We have a real opportunity to summarize the results of the vegetable season and to analyze the pluses and minuses of the year that is coming to an end. Incidentally, the number of pluses is so scant that it is even somehow awkward to focus attention on them. For many of the republic's residents the bad memories from the frequent shortages of first one and then another vegetable have not been diminished. Interruptions in their supply took place both during the height of summer as well as during the golden fall.

This distressing conclusion is confirmed by the figures of TSSR Goskomstat [State Statistical Committee]. This year consumers received almost 23,000 tons of vitaminous products fewer than the plan goal. But for the sake of fairness we should note that in comparison with last year vegetable procurement volume increased by 36,000 tons. However, even this increase was sometimes inadequate to satisfy the population's demand. Often it happened that in some parts of the republic there was a surplus of vegetables whereas in others there were interruptions in supply. The fault lies not so much with the supply and transportation organizations as with fallacious planning practices. The basic producers of vegetable products remain, as before, the regions of republic subordination. This year they procured 201,000 tons of vegetables. At the same time Chardzhou, Mary and Tashauz oblasts together produced a little more than 100,000 tons of products. The annual plan for vegetable production was fulfilled by these oblasts by 86.6, 73.4 and 67.7 percent respectively. However, the regions with republic subordination fulfilled their plans by 105.9 percent. To comment on these figures would be superfluous. In all three oblasts cotton is a priority, as before, and there is only talk about saturating the consumer market with vegetables. In the early part of the year specialists from TSSR Gosagroprom [State Agroindustrial Committee] assured us that the area in vegetables would be expanded significantly and that this would enable us to eliminate the vegetable shortage. On paper everything looked good, but a great deal simply remained a good intention.

In short this is the general picture involving vegetable production. But there are even greater constrasts when we speak of assortment.

Tomatoes occupy first place in general deliveries—119,000 tons have been produced, or one-third of all procured vegetables. Of this quantity about half comes from regions of republic subordination. Thirty thousand tons have been gathered in Mary Oblast, 23,000 tons in Chardzhou Oblast and only 8,000 tons in Tashauz Oblast.

Judging by the figures, there should be no talk of tomato shortages in Ashkhabad, Bezmein, Nebit-Dag, Krasnovodsk and other cities in the western part of the republic. However, interruptions in supplies continued to plague the residents of this region. What is the problem? There are several contradictory opinions about this. Many specialists from TSSR Gosagroprom feel that the main problem was the excessively hot summer, in the course of which late and average maturing tomato varieties simply perished so that in August there was nothing left to

harvest. Others feel that the directors of the largest vegetable enterprises misunderstood the independence that has been given them and have been emphasizing the cultivation of early tomatoes only. A portion of the harvest that has been cultivated is shipped outside the republic and sold according to high procurement prices to the detriment of the republic's own consumers and processing enterprises. Large batches of tomatoes are sent to other regions of the country according to direct contracts and 30 percent independent sales. Some also allude, and not without foundation, to the fact that not a hundred tons of tomatoes have been shipped out of the republic by cooperatives. As we can see there are many opinions, and the truth is somewhere in the middle. Mistakes in planning, confusion and lack of control were the most likely sources of stress in supplying the population with tomatoes.

We can hardly agree with the fact or even justify that in late August and early September it was necessary to "nourish" the residents of the capital with tomatoes that were brought in from Mary Oblast. Such countershipments of vegetables interfere with the work of railroad transport and bring considerable losses to the government.

Onions occupy second place in gross vegetable output. This year over 79,000 tons of onions were produced, or almost 10,000 tons more than last year. The main producers of onions are again the rayons of republic subordination. They supplied consumers with 71,000 tons. For the sake of comparison let us say that three oblasts have gathered only 8,000 tons. Tashauz Oblast, for example, fulfilled the plan by 23.7 percent, having procured only 948 tons of onions. Unwillingly the question arises: How will this region "make up for" the deficit? It is not necessary to tell fortunes using coffee grounds. Trains with onions were sent to Tashauz recipients. The question arises: Why such long drawn-out proceedings? After all, in the very northernmost oasis people know how to cultivate excellent onions, but in recent years the area in this crop has decreased considerably.

In previous years cabbage was third in gross vegetable production. Today its procurement volume has reached almost 60,000 tons. Again the lion's share of its production belongs to the regions of republic subordination. They provided 46,500 tons of cabbage and will be able to add another hundred tons to this. Here is how the plan was fulfilled by oblasts in this area: Chardzhou Oblast—by 67.0 percent, Mary—43.7 percent, and Tashauz—40.9 percent. With these kinds of indicators what kind of concentration of efforts or labor achievements can we speak of?

No matter how paradoxical, even in Ashkhabad it has become more difficult to supply the population with cabbage. At this time usually the capital's residents have procured enough cabbage for future use; now this kind of opportunity has noticeably diminished. Cabbage appears periodically within the trade network, and prices for it have increased.

This year 30,000 tons of so-called other vegetables were produced—eggplant, peppers and dill. The republic has fulfilled the plan for this indicator by almost 136 percent. It would seem that there is no reason for displeasure. However, in 1988, 3,000 tons more of other vegetables were procured. There were practically no problems at all involving acquiring eggplant. Today such cases occur fairly frequently. Consequently, for these types of vegetables as well things have not been regulated completely.

The procurement of the aforementioned vegetables has provided the opportunity to "pull up" the annual plan. There was complete failure in the production of the rest of the vegetables—cucumbers, carrots, beets and potatoes. The republic's residents have already become accustomed to the fact that they can eat fresh vegetables only at the beginning of the summer, after which these vegetables practically disappear from the shelves. They blame only the heat for this. Of course producers could be rebuked for their sluggishness and for their lack of desire to become seriously involved with this capricious crop, but a fact remains a fact—in the republic there is still not a single regionalized variety of cucumber and this does not bother scientists-agrarians a single bit.

The attitude toward potatoes is the same. In the Kirghiz SSR, for example, four local high-yield potato types were introduced long ago, but our potato farmers have been forced to bring in seed material from Siberia, Belorussia, the Ukraine and the Transvolga area for half a dozen years. As a result, in our republic we cannot see even the smallest amount of progress in potato farming. This year 11,000 tons of tubers were dug up as compared to the planned 22,000 tons. There is no need to even speak of quality.

For many years in a row the category of "undesireable" vegetables has included carrots and beets. Their production quotas are fulfilled only by half. As of late November 9,600 tons of carrots were harvested as compared to the planned 16,580 tons. Carrots did not reach the trade network all summer. Again specialists blamed the heat and promised that in the fall all of the stores would be full of this vegetable. What is the benefit to the population of such extremes—either the stores are empty or they are overflowing? Isn't it possible to reach a golden mean?

Unfortunately, there have been no positive changes in improving the quality of vegetable production. The principle that everything that is brought from the fields to the stores must be sold put even greater pressure on consumers. Enterprises and the trade network preferred not to think about adhering to the elementary GOST standards, and what was produced was immature and overly ripe tomatoes, onions and carrots with their leafy tops, rotten potatoes and damaged eggplant. This season even firm kolkhoz stores offered non-standard and poor-quality products for sale.

The vegetable season is over. Today village residents are carrying out a complex of fall-winter field operations and are preparing for putting in the 1990 harvest. What will

the future year bring to consumers? New disappointments and long lines while waiting for vitaminous products? Only one thing is clear—that vegetable farming must move out of its stagnation and fully meet the needs of the population for the most important food products. For this we must first and foremost alter the attitude toward this branch on the part of agricultural production.

Procurements Criticized in Uzbekistan

904B0114B Tashkent SELSKAYA PRAVDA in Russian 20 Dec 89 p 1

[Article by V. Khabibullayeva: "Reserves for the Winter Table"]

[Text] Above and beyond that which is cultivated in gardens and orchards it is impossible to store up produce from anywhere else. Stores depend on the harvest. Under the conditions of the past season, when spring frost killed a significant portion of the orchard harvest, most of the republic's oblasts were not successful in stockpiling a large quantity of apples, grapes and other fruit. Vegetable products are another matter. In the spring vegetable farmers resowed and replanted vegetable seedlings, thereby making up for the losses brought about by the natural calamity. Average-maturation and late varieties were also saved. The stockpiling of vegetables for storage and sale during the winter period begain in an organized manner and is proceeding at full speed. In the republic as a whole the plan for the stockpiling of cabbage, carrots, turnips, onions and garlic into vegetable storehouses has been fulfilled by 102.5 percent. Except for Fergana, Syr-Darye and Tashkent, all oblasts have succeeded with the quota. In the enterprises of the republic's cooperative association, Uzbekistan, instead of the planned 181,000 tons of vegetables it appears that 188,000 tons of vegetables will be stockpiled for the winter and right now this work is proceeding precisely according to schedule.

The trade organizations of the Uzbekistan association are in the process of pickling tomatoes and cucumbers and of fermenting cabbage. Right now the plan has been implemented by over half. Being prepared for use is a new recipe for pickling tomatoes and cabbage which association specialists brought from Kiev and Kharkov. Various supplements in the form of spices and curative grasses will improve the taste qualities and storage life of pickled tomatoes and fermented cabbage. We went to Alma-Ata Oblast for the other innovation which promises procurers and consumers more of an advantage. There, in Sovkhoz imeni Dzhondosov, progressive methods for storing fruit and vegetable products were studied. The new method for storing fruit and vegetables within a regulated gas environment will be used starting next year at Tashkent Fruit Combine Number 5 as well as in Samarkand Oblast. What does it consist of? A vacuum is created in regular refrigeration rooms. In breaking air up into its components, oxygen is released into the atmosphere and nitrogen and carbonic acid gas are returned into the chamber. In this gas mixture the fruit "breathes" without the action of the external environment. Moths and other microorganisms in vegetables and fruit fall asleep without oxygen, ceasing their development; in this way the deterioration and rotting of the fruit is avoided. Experiments have shown that apples of the Aport variety can be stored in this kind of vacuum system for 10-11 months and that in this case only 5-6 percent of products are lost. Moreover, "having left" the refrigeration chamber the apples retain their freshness for another month. This means that the market can reduce losses to a minimum and that the purchaser will have fresh fruit all year. Let us remember that in regular refrigerators apples can be stored for only 3 months and in this case losses equal 26 percent. It is not difficult to calculate the economic effectiveness of introducing this innovation everywhere.

In a situation in which up to half of the cultivated harvest of food crops is ruined repeatedly, all innovations directed at improving the work of storehouses acquire a priority significance.

Uzbek workers learned from Kirghiz procurers the experience of pickling vegetables with cooling. Allowing cold to enter the room in which the pickled vegetables are found enables workers to prolong the storage period until the May holidays, in other words until the time when the harvest of early cucumber crops appears on shelves. This method will be used at the second and third Tashkent fruit combines. Beginning next year pickling with cooling will be assimilated in Bukhara's trade organizations.

The deterioration of produce in railroad cars gives rise to great complaints against those who ship fruit and berries from the southern part of the country to the central. Last year Uzbekistan sent 100 tons of grapes to Moscow, having first cooled them. The result exceeded all expectations—having been en route for almost 1 week the delicate "sun berries" reached the capital 100 percent preserved. How is this achieved? The grapes are cooled on a preliminary basis in chambers located in a storehouse near the railroad; then they are rapidly loaded into refrigerator cars. This loading method was first tested at Chartak station and now we plan to significantly expand its use.

However, no matter what useful innovations are introduced during the procurement of fruits and vegetables in order to sell them to the population during the fall and winter period, first and foremost it is essential to have model modern storehouses. Yet from one year to the next the plan for their construction falls through in the republic. This year it was planned to introduce into operation vegetable storehouses with a capacity of 100,000 tons. Although the construction of vegetable storehouses proceeded at a more rapid pace than last year, the capacities that were introduced in the course of 10 months comprised only 49,800 tons. The shortage and shortfall in deliveries of equipment are hindering operational starts.

...Today vegetable farmers are collecting the harvest of underground varieties of root crops. Carrots, turnips,

radishes and beets are being dug out. Late cabbage is being cut from the last hectares. The collected vegetables are being stockpiled. It is planned to complete this work by the end of the year and to continue the sale of vitaminous products for the winter table of citizens.

ELECTRIC POWER GENERATION

Absence, Distortion of Data on AES Safety Criticized

904E0038A Moscow SOVETSKAYA ROSSIYA in Russian 20 Dec 89 Second Edition p 2

[Interview with B.A. Kurkin, candidate in Law, senior reader of the Higher Legal Correspondence School of the USSR Ministry of Internal Affairs, by O. Plakhotnikova: "Bombardment of the Nucleus of Truth: Arguments of a Nonprofessional in the Controversy about Nuclear Power Engineering"]

[Text] In the notes from the international "roundtable" at the USSR Nuclear Society ("Spor bez opponentov" [A Debate Without Opponents] of 12 October 1989), we were deprived of the opportunity to hear the conclusions of the opponents of the AES. Today the talk is continued by B.A. Kurkin, candidate in Law, senior reader of the Higher Legal Correspondence School of the USSR Ministry of Internal Affairs.

[Plakhotnikova] Boris Aleksandrovich, you, just as the other opponents of the nuclear specialists, often have to listen to charges of incompetence. They would appear to have grounds for this: you graduated from the Department of International Law of the Moscow State Institute of International Relations and have published 40 articles and a book on problems of sociology. In a word, you have nothing to do with nuclear power engineering directly. On what basis, then, do you take it upon yourself to judge the professionals?

[Kurkin] As practical experience shows, the lack of a diploma does not in itself indicate the inability to direct one's attention to a certain specific problem. You do not have to go far for an example: IAEA director H. Blix is a lawyer by profession. On the other hand, even the workers at AES are professionals, but the facts of accidents at nuclear power facilities are concealed from them, just as from the government and society. By refusing "nonspecialists" the right to their own opinion, the specialists themselves, contrary to their own logic, are claiming all-comprehensiveness. I cannot believe, for example, that O. Shumyatskiy, the public relations plenipotentiary of the Nuclear Society constantly takes part in public discussions, and is at the same time a specialist in the fields of economics, ecology, law, sociology, geology and other sciences. The charge of incompetence may prove to be mutual.

Here O. Kazachkovskiy, doctor of physical-mathematical sciences (he was for a long time editor-in-chief of the journal ATOMNAYA ENERGIYA and headed one of the institutes) declares on the pages of PRAVDA that AES "emit nothing into the atmosphere." It is written in all the textbooks, however, that AES emit a considerable amount of radionuclides—such as iodine, cesium, strontium and xenon.

[Plakhotnikova] If you argue this way, however, it will never lead out of the blind alley.

[Kurkin] We expect one thing from a professional—an honest, frank talk about the real problems of nuclear power engineering. Unfortunately, however, many nuclear specialists today are deprived of the possibility of expressing their independent point of view. If they divulge their departmental "secrets" they, bound by signed statements, risk being out of a job. For example, the administration and Party committee of the Kalinin AES punished G. Asinkritov, mechanical engineer of the nuclear power engineering unit, who actively came out against increasing the power.

You may have noticed that, approximately from last fall, nuclear scientists from among the "loyal ones" have not simply begun to talk, but have literally gone on the attack. What is the reason for this departmental "breakthrough of glasnost"? It is all very simple: the specialists have been ordered to leave their nuclear bunkers and bastions. The decision was made to create an "interdepartmental council for information and links with society to coordinate propagandistic activity in the sphere of nuclear power engineering." The Center for Public Information on Nuclear Power (TsOI), the basic task of which is to "work out recommendations and methodology for carrying out propagandistic work," has become the executive body for the interdepartmental council.

It is most paradoxical that our own money will convince us of the usefulness of an AES: the activity of the TsOI is financed from the State budget. They do not spare currency there, although there is not enough even for medicine: one of the deputy ministers received an order to "specify in the plans the distribution of centralized currency funds for 1989-1990, the allotment of appropriations to acquire the necessary imported equipment and materials consumed to equip the TsOI."

This means that soon you and I will be able to read brochures about the ecological purity of nuclear power, printed on Finnish paper, which we receive at the same time as the radioactive wastes of the Finnish Loviis AES, and which we pay for with power from the Leningrad AES (its wastes, naturally, are left for us).

Unfortunately, it is still too early to speak about the triumph of glasnost. For example, there is a great deal of talk about dismantling AES, but few people know that the problem simply brooks no delay. The service life of a unit is 25-30 years. Today, for various reasons, the 1st and 2d units of the Belorussian AES, and the 1st units of the Novovoronezhe and Roven AES have been shut down, the Armenian AES has been completely shut down, but the concept of dismantling is still at a stage... of development.

Another problem: radioactive wastes. How do the nuclear departments plan to store them, and where is the guarantee that this problem will actually be solved some day?

[Plakhotnikova] Boris Aleksandrovich, are you not laying it on a bit thick? After all, even before Chernobyl, IAEA director H. Blix said that "no technical discoveries are needed to guarantee a safe method of burying wastes."

[Kurkin] Nowhere in the world has the burial of highly active radioactive wastes yet been carried out. There is experience only in storing them temporarily.

The serious nature of the situation in nuclear power engineering is being exacerbated by the fact that our country is little-by-little turning into a depository for the wastes of the CEMA member countries and Finland. In addition, we are constructing AES in Cuba, will construct one in India and will consequently accept their wastes.

True, responsible workers in the nuclear departments, particularly V. Semenov, former director of the GKAE [USSR State Committee on the Use of Nuclear Power], and Ye. Velikhov, director of the IAE [Institute of Nuclear Power of the USSR Academy of Sciences imeni Kurchatov], vice-president of the USSR Academy of Sciences, are trying to convince our public of the advantages of those "wastes." True, it is not clear on what this gross misinformation is calculated: on the complete ignorance of our people or on their complete silence? Judge for yourself the advantage of perpetual storage of death on our land: V. Semenov promises us receipts of about one billion dollars for 30 years (per power-unit billion). After all, though, this payment is for loss of health, and perhaps, even life!

Our "professionals" often set in motion an argument that is incontrovertible from their standpoint: they say, in the past year alone, 345,000 persons have been victims of railroad-transport accidents, and in the Chernobyl accident 31 persons perished and 145 fell ill from radiation sickness. Incidentally, this is again misinformation: just from those who worked at the Chernobyl AES since 1987, over 60 persons have already perished, about which the public knows nothing.... This is the logic: must we struggle for the safety of the AES, is it much better for people to perish in transport? This statement of the question is absurd. I will note that in one of the studies, prepared by order of the government of the United States and published in the newspaper NEWSDAY [NEWSWEEK?], it was said that there is a 50-percent probability that by the year 2000 in the States an incident analogous to the accident at Three Mile Island will take place.

[Plakhotnikova] In our country, however, in the words of responsible people, AES safety is increasing. For example, at a meeting between M. Gorbachev and workers at the Chernobyl AES, excerpts of which were presented in SOVETSKAYA ROSSIYA on 23 February, academician Ye. Velikhov said that safety had risen by an order of three, that is, by approximately a factor of 1000.

[Kurkin] To make such a bold and responsible statement, it would be necessary to construct a large number of identical AES, select personnel to work at them that are similar in all parameters (professional, psychophysiological, etc.), operate these stations for a fairly long time and study the accident statistics during this period. If the number of accidents at new or modernized AES actually drops in the order of three, only then could specialists be able to say that the safety of AES has increased by a factor of 1000.

Right now there is not a single reliable reactor in the country. The VVER-1000 reactor, now being introduced instead of the RBMK-1000, which already proved itself at Chernobyl, is already obsolete, and the steam generator was constructed in such a way that its resource is limited to 2-3 years. A minimum of 15 steam generators has already gone out of operation and been replaced at these reactors. Each one of them costs 23 million rubles. The direct loss from this has already been over 350 million, not counting the indirect losses. It will go on this way.

Today we hear time and time again competent assurances that "we could not get along without AES." How are the plans for developing a power complex being drawn up, though? Several years ago the power of our AES was to reach 196 million kilowatts by the year 2000. Today they say that by the year 2005 it will be brought to 55-80 millions. At the same time they emphasize that the figure of 55 is much more probable than 80. All this indicates that such programs are being "made up." To ask how much energy we need means to be like the hero of one of the Chaplin films who asked: "Will you tell me at what stop to get off—I forgot the name of my street."

If you reveal the actual picture of our needs for energy, eliminate its losses and unnecessary expenditures, then the answer to the question, nuclear power engineering—to be or not to be—will probably be different than it is today.

Prerequisites for Nuclear Power Development Ignored

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[Article by Boris Kurkin under the rubric "Ecological Bell": "The Parameters of Nuclear Safety, or Dead Rat Stew"]

[Text] *"The result is as the labor was."*--Peter I.

Nuclear power has come under steadfast and far from dispassionate public scrutiny of late. And that is not surprising. Chernobyl could have buried another state forever.

But the debates that have been launched lately in our press on the score of the "peaceful atom" are developing principally along the lines of whether or not nuclear power is a good thing in general. The issue of the

essential and sufficient conditions for the development of nuclear-power engineering arises much more rarely. And our nuclear-power people—having come up out of their caves by the 15 Aug 1988 order of the former chairman of the USSR Council of Ministers Bureau on the Fuel and Power Complex, B.Ye. Shcherbina, to institute active counter-propaganda among the population—are prudently holding their tongues about these problems.

So then, what are the essential and sufficient conditions for the development of nuclear-power engineering, do they exist in our country and, if so, to what extent?

Condition One

No one would deny that it is essential to have a reliable power unit at our disposal in order to develop nuclear power.

Does one exist here? The basic inventory of our reactors, as is well known, consists of the Aleksandrov boiling-liquid RBMK [large-capacity channel] reactor and the vessel-type VVER-440 and VVER-1000 [water-moderated water-cooled power] reactors.

It seems that the immortal (alas!) Aleksandrov RBMK reactor needs no additional recommendation. But I would like to add to what has already been said in our literature the opinion of a well-known specialist in the realm of reactor building, E.-L. Zebroski, nonetheless.

E.-L. Zebroski, who prepared the material presented by the United States at a Vienna conference of IAEA experts in August of 1986, did a comparison of the safety of the RBMK and Western pressurized water-cooled reactors (PWR) according to 19 parameters. The results obtained were stunning: the RBMK corresponded to the international level for just one (!) parameter.

It furthermore became clear that the graphite pile of the RBMK begins to swell under the effects of radiation, and the first power unit of the Leningrad AES [nuclear power plant] was unable to serve half of its standard service life for that reason.

The same fate awaits other AESs equipped with Chernobyl-type boilers. The economists still have to calculate the direct and indirect losses caused by the effects of the "swelling" of the graphite pile.

Now the VVER. It is no secret to any specialist that the VVER-1000 reactor—the hope and bulwark of our nuclear-power engineering—was already obsolete in the design-engineering stage, that is, before it was even born.

But matters are not limited to that alone: it turned out that the service life of the PGV-1000 steam generators, which was (like the service life of the VVER-1000 reactor) to have been 30 years according to the calculations, is considerably less than the nominal one and varies from 1.5 to 7 years. It costs 23 million rubles. The cause of this deplorable occurrence is the lack of conformity among the properties of the steel employed in it, the level of stresses and the structural elements of the steam generator. At least 15 steam generators have broken down and been replaced.

The direct cost of the premature replacement of steam generators now totals about 350 million rubles, not counting, naturally, the indirect costs determined, in particular, by the failure to supply electric power to the country's overall power grid.

The average service life of the steam generators, as shown by the sorry experience of the power units at the South Ukraine, Zaporozhye and Novovoronezh AESs, is limited to 2-3 years. If matters proceed in this manner in the future as well, our losses will be simply astronomical, since every power unit is equipped with four steam generators. How many of these will have to be replaced over 30 years, allowing for the total number of VVER power units both in our country and abroad? We will also have to replace them in overseas countries as well, after all, for example in Cuba and India, where we intend to build AESs.

And here is a curious detail: everyone knows this, from the rank-and-file AES worker up to the chairman of the USSR Council of Ministers Bureau on the Fuel and Power Complex, L.D. Ryabev. His first deputy, V. Marin, the director of the Institute of Nuclear Power Engineering imeni I.V. Kurchatov, Ye.P. Velikhov, the USSR Minister of Nuclear Power Engineering and the Nuclear Power Industry, V.F. Konovalov, the chief designer of steam generators, V.V. Stekolnikov, and many, many others all know this. And what of it? Nothing. The guise is taken that nothing special is happening.

True, a plan of measures exists for modernizing the steam generators, but, as specialists affirm, a steam generator of a different design is essential.

The only consolation is the fact that science, as is customary, does not stand still. The news that a department head at the Moscow Power Engineering Institute, Doctor of Technical Sciences N.G. Rassokhin, has been awarded a USSR State Prize for 1989 in the realm of science and technology for the textbook "Steam-Generator Installations of Nuclear Power Plants" (3rd ed., 1987), has been received with a feeling of profound satisfaction.

A state prize for a textbook on a chimerical steam generator, chimerical indeed, because those that are not chimerical **work!**

If matters proceed in this manner in the future as well, then, taking into account the spiritual conditions extant in the country today—an interest in magicians, false prophets, "strangers" etc.—we will soon begin writing out prestigious prizes, say, for textbooks on demonology or palmistry.

But since the signing of the decree on the awarding of USSR state prizes by M.S. Gorbachev and N.I. Ryzhkov,

there are grounds to suppose that objective information on the state of affairs in nuclear-power engineering will not always reach the supreme leadership of our country...

The failure of a steam generator could cause an accident similar to the one at the Three Mile Island AES, but on the scale of Chernobyl.

The scale of the catastrophe could be determined by the fact that the protective casing of the reactor (the "dome") is more an appearance of a protective structure than a protective structure. It has already been noted in our literature that the science and technology of constructing protective casings in this country is in an embryonic state, and there is not even anything to be said about the quality of its execution.

Taking into account the deplorable circumstance that we have no reliable power units, our nuclear agencies have developed the VVER-88 project on a crash basis. What kind of a project is it?

The very same VVER-1000 system, but equipped with additional protection systems and the very same unsuitable steam generators. The project is doubtful enough from that alone, but that does not exhaust the matter.

Two years have been spent on the VVER-88 project, but not a single technical-engineering decision on the additional protection systems has been checked experimentally (the hydrogen-removal system, for instance, all sorts of filters, the trap for fuel able to spill into the reactor bottom etc.). The project, as specialists affirm, differs only through the purely mechanical combination of additional protection systems, which far from increases the safety of the power unit, the same way as the cohabitation of pregnant women does not accelerate births.

The project was clearly done in haste, under the impression of Chernobyl, by virtue of the strict necessity of reporting back to the higher authorities that "the lessons had been learned." And what of it?

The power unit became 15-20 percent more expensive, while the number of personnel for it increased to 2,500 (!!!) people.

The economic indicators for the operation of such a power unit will be very depressing. Most likely, unprofitable.

The new power unit is still extremely metals-intensive: 2-3 times more concrete, for example, is required than for the VVER-1000. (It would not be superfluous to note that if capital investment totals or exceeds 700,000 rubles per kilowatt of installed capacity, the construction of an AES will be simply wasteful.)

The CEMA member countries for that reason are not supporting the work on the VVER-88 (they simply cannot afford such a project), while Hungary is already negotiating on the construction of reactors being proposed by French and Canadian firms.

Plans of measures for improving the design of the VVER-88 naturally exist in abundance, but these plans unfortunately are not backed up materially and are not being supported.

As those initiated into the secret of the VVER-88 joke gloomily, "Everything is here, everything is as it should be, but nothing works."

Taking into account the fact that the VVER-88 design was entirely a stillborn one, the idea arose for the AES-92 project—a completely new design called upon to resolve problems of the technical equipping of our nuclear-power engineering for the extremely long-term future. But the misfortune here is that there is no money for this project, and the organizational difficulties for devising it are too great!

A somewhat awful situation is this taking shape: an AES cannot be built according to the old designs in view of the absolutely backward economic indicators and experimentally untested safety systems, while new ones are not foreseen.

The situation in which our nuclear-power engineering has unexpectedly found itself is reminiscent of a situation where there is no ammunition but one has to fight.

But the most noteworthy thing in this whole story is the fact that the general design engineer for the Project-88, repudiated by practically everyone—Atomenergoproyekt [Nuclear-Power Engineering Design Institute]—is still continuing to finance it.

It cannot be said, of course, that our nuclear-power chiefs have not been seeking a way out of this situation. They are looking. The leaders of the AES VNII [All-Union Scientific-Research Institute of Nuclear Power Plants], and first and foremost its director, A.A. Abagyan, are proposing to compensate for the lack of electrical instruments that meet contemporary standards through tightening up the operating conditions and developing modern monitoring and diagnostics equipment.

But here is the misfortune: there is no ideology or conception of the monitoring and diagnostics of power equipment. It is really essential, before creating various types of monitoring and measuring instruments, to clarify what it is we intend to measure and why, since it is obviously impossible to measure everything, and probably unnecessary as well.

Such a program is lacking, however. And contemporary instrumentation proves in a number of cases to be completely unsuitable. The equipment for flaw-detection monitoring, which gives too large a spread of readings, is clearly unsuitable, and thus not all parameters of reactor safety are metrologically supported (the moisture level, for instance).

The UD-12 flaw detector produced by the Kishinev Volna NPO [Scientific Production Association], by the way, has been awarded a VDNKh [Exhibition of the

Achievements of the National Economy of the USSR] Gold Medal, but there is definitely no possibility of believing in either it or its modernized brethren.

The sole method of verifying the quality of the pipe welds through which water is fed into the main circulation pumps of the RBMK reactor is thus to send a flaw detector through it and crawl along 5-6 meters at a time. The sole criterion for evaluating the quality of the work therein is the conclusion of the detector operator, which makes relations between those operators and the welders especially delicate, since a negative conclusion by the "inspector" automatically deprives the welders of bonuses and forces them to reweld the joints. The rewelding of joints, however, reduces their "service" compared to welds that were welded in quality fashion right off.

Condition not met.

Condition Two

Solving the Problem of Radioactive Waste and the Dismantling of AESs

The problem of storing and burying radioactive waste (RW) is a most important and unsolved problem of nuclear-power engineering.

No one is the world yet knows where and how to store highly active RW, although work in that direction is being done. The discussion still concerns just the promising—and far from commercially applicable—technologies of enclosing highly active RW in refractory glass or ceramic compounds. It is not clear, however, how these materials will behave under the influence of the RW encased in them over the span of millions of years. (The enormous half-life of a number of radioactive elements forces such a long period of burial for RW.) It is clear that its escape to the outside will be inevitable, since the material of the containers in which it is encased will not "live" that long.

It is being proposed that the RW encased in refractory glass or ceramic compounds be buried in geological formations at great depth (one kilometer or more). Very exotic plans for burying RW under the sea bottom or even discharging it into the sun are also being developed. (It only remains to guess what stupendous sums that will cost.)

The danger that a missile with a container were to suffer an accident, which would signify an ecological catastrophe, is too great, however. It is even impossible, unfortunately, to guarantee the safety of RW transport by railroad (and today especially by railroad).

It is also not clear how the geological formations in which the burial of RW is being proposed will behave as well. These formations should meet requirements of high seismic stability, impermeability to water and so forth. Soviet specialists have indicated at least a dozen conditions that the ground must meet. All of these conditions, moreover, as regrettable as it may be, are central ones!

It is also never possible to be sure, or more precisely to know, which of those formations could be suited for some other use not associated with the burial of RW in the future as well.

All of the technologies for the treatment and storage of RW, in short, are theoretical and doubtful. And if the representatives of our Chernobyl agencies will, as is their custom, dispute that fact, it would be appropriate to ask them, "Why were they then planning, right up until this year, to pump highly active liquid RW into a reservoir below the Yenisey in the Krasnoyarsk region?" And there are no guarantees that this problem will ever be solved, that is, before the Day of Reckoning. The burial of highly active RW, by the way, is not yet being done anywhere in the world. Experience exists only in its temporary storage. The country, courtesy of our nuclear agencies, however, is being turned into a trash heap of the radioactive wastes of foreign countries—the CEMA member countries, Finland and, in the future, West Germany. We are already receiving over 300 tons of spent fuel annually from foreign AESs. And soon we will be receiving RW from Cuba and India. This has already been written about in our press.

True, senior officials of nuclear-power agencies—and especially the former deputy chairman of the GKAE [State Committee for the Utilization of Atomic Energy], B.A. Semenov, and the current deputy general director of the IAEA, director of the IAE [Institute of Atomic Energy] imeni I.V. Kurchatov and USSR Academy of Sciences Vice President Ye.P. Velikhov—are trying to convince our public of the advantages of these "deals." If we are to believe Comrade Velikhov, the spent fuel is a most valuable product devoid of any harmful impurities (intrinsically RW), and according to Semenov, we can raise our welfare splendidly by accepting spent fuel for storage (essentially that same RW) from outside AESs.

True, it is not clear what this disinformation is intended for—the complete ignorance of our people or keeping them completely quiet.

It is obvious here that we are now dealing with wastes of a moral nature. And all the same, let comrades Semenov and Velikhov tell us in more detail about the terrible catastrophe at the RW storage area around Chelyabinsk in 1957, which was called the "Hiroshima of the Urals," and about how we are continuing to destroy our own artesian wells, and thus the health of our people, by pumping highly active RW into them.

By the way, on the "profit" of the perpetual storage of death on our land, B. Semenov promises that we will receive about a billion dollars over 30 years (for one million-watt power unit). I would like to ask him where the 176 million dollars that we received from the sale of oil over 10 years (1974 through 1984) went. Won't it happen again that we sell off the whole country and are left sitting in a deadly cesspool? (The latter is not subject to doubt.)

I would hope that these esteemed men of science will not deny the especial hazards of the perpetual storage of RW. Disputing that, after all, is the same as disputing the multiplication table.

Aside from that, as the representatives of Goskomatom [State Committee for the Utilization of Atomic Energy] note, contacts exist between the USSR and West Germany for the enrichment of natural uranium received from the FRG. The enriched uranium, however, is ready nuclear fuel (it only remains to encase it in heat-producing pellets and assemblies).

But the USSR, as is well known, takes in spent fuel from the same foreign AESs to which it supplies fuel. All of this creates favorable opportunities for all sorts of underhanded technical and production machinations and combinations, as a consequence of which the RW of foreign AESs will be buried in the USSR. The replies of the staffers at GKAE to this are always vague.

We are furthermore exporting electric power from AESs to CEMA member countries, along with Finland and Austria, leaving ourselves with the RW. The export of our nuclear electric power to China and North Korea is also being proposed (NOVYY MIR, No 4, 1989, p 199).

The problem of dismantling the AESs themselves, as well as the enterprises for the production and processing of nuclear fuel, could also be relegated here. They will, after all, also be "nuclear wastes" themselves after a certain period of time.

It should be emphasized that the concept of dismantling AESs is still just in the development stage in our country, while the first and second units of the Beloyarsk AES and the first units of the Novovoronezh and Rovensk AESs have already been shut down. The "swollen" graphite pile and first unit of the Leningrad AES have been halted for overhaul. Their fate is exceedingly uncertain: the "Chernobyl agencies" are not allocating any money for dismantling them.

It should be noted that we will be facing gigantic expenses for the dismantling of AESs and the perpetual storage and burial of RW, not to mention the necessity of investing fantastic sums for the construction of new AESs. The cost of the so-called post-reactor cycle, which includes the removal of spent fuel from the reactor, its transport, chemical treatment and storage, has increased by tens of times over the last 15 years. But we accept the wastes from the AESs of the CEMA member countries and Finland for free.

And, finally, the technology for processing spent fuel from the high-temperature reactor (VTGR)—which we are developing in conjunction with scientists from the FRG and which is, according to the opinions of Soviet and foreign specialists, extremely unsuccessful—has not been completely developed. The start of construction on this reactor is being proposed for Dimitrovgrad in Ulyanovsk Oblast.

According to reports in NUCLEAR ENGINEERING INTERNATIONAL (No 422, Sep 1989), an agreement has been signed between Tekhsnabeksport [Technical Supply for Export] and the firm of HTR GmbH (FRG) to deliver an 80-MW modular high-temperature reactor for the construction in Dimitrovgrad. A great deal of the design and engineering work for the modular nuclear installation will be performed by specialists from the FRG, while the energy balance of the installation will be determined by the Soviet partners. The whole structure will cost roughly 400 million DM—or (in accordance with the latest fluctuations in the exchange rate of the ruble) about a billion foreign-currency rubles—before the first launch. It looks like we are finding money for adventures?

Condition not met.

Condition Three

The Skilled and Safe Operation of Nuclear-Power Facilities

Another unsolved problem of our nuclear-power engineering is the "absolute" safety of AES operation, as well as that of the enterprises that produce and process nuclear fuel. Absolute safety of nuclear-power facilities, naturally, does not exist, and the risk of a new Chernobyl thus hangs over us like the sword of Damocles.

The risk of a new nuclear catastrophe is exceedingly great—this is acknowledged by the workers of nuclear agencies themselves (see NOVYY MIR, No 9, 1988, p 173). They see the reason for this as the extremely poor quality of the construction and operation of Soviet AESs. One cannot fail to agree with this. As the press testifies, we are clearly short of qualified operators, especially operators to support maritime vessels, and the training of specialists in the realm of nuclear-power engineering is getting worse year by year, while skilled specialists are "fleeing" the sector. The shortage of the corresponding trainers is thus acutely felt, while labor discipline is too low. The operators of AESs shut off the protective systems of the reactor left and right (so as not to stop the reactor and disrupt the plan targets). And all of this is after Chernobyl.

Furthermore, accidents at our nuclear-power facilities have thus far been concealed even from the AES workers, and not just the general public. One would ask: how can the mistakes of operational personnel be analyzed so as to prevent them in the future under such conditions?

It should be noted that the operational personnel of AESs, for the most part, have no opportunity for full rest or training, are deprived of normal working conditions and are placed in a literally serf-like dependence on the administration.

All of this has impelled the operational personnel of the Kursk AES to come forward with an initiative to create

a new and independent association called upon to protect the rights and dignity of its members.

Condition not met.

Condition Four

The Competent Placement of Nuclear-Power Facilities

The principles for locating operating AESs and those under construction are extremely unsatisfactory. They are located close to major cities and at the sources of rivers. The whole Volga is thus "mined" with delayed-action nuclear charges.

AESs are constructed on model chernozem, clay and karst ground, which is completely impermissible.

The academic associates of the All-Union Institute of Mineral Raw Materials (VIMS) of USSR Mingeo [Ministry of Geology] prepared a document back in 1984 describing the placement of plant sites of a number of AESs and ATETss [nuclear heat and electric power plants] relative to tectonic structures and active faults. It was revealed that our AESs, with rare exceptions, and especially the South Ukraine, Zaporozhye, Beloyarsk, Kostroma, Kalinin, South Urals and the Voronezh AST [nuclear heating-supply plant], are located in the immediate proximity of active tectonic faults or along the edge of tectonic plates.

Experimental data were also obtained in the course of research that made it possible to presuppose the presence of a little-known but fast-acting geodynamic process—short-lived subcrustal local disturbances (SSLD)—that differ markedly from earthquakes. (A report on the features, nature and method of recording them was given at a session of the "AES Location and Ecology" section of the Physio-Technical Problems in Power Engineering Division of the USSR Academy of Sciences in May of this year).

The essence of the process is the fact that over the course of a few dozen minutes (or, more rarely, hours), disturbances arise in the surface and subsurface hydrosphere ("bumps" and "depressions" along the ocean surface) along with the deformation and failure of the ground, the activation of landslides and karst processes and the formation of benches and inclines at the junctures of plates.

Some of the specific features of the development of a number of instances of accidents, VIMS staffers assume, can be explained from this viewpoint—the blowout of bridge supports and destruction of wide-span bridges (in Velikiy Ustyug and Kalinin), deformations in the foundations of dams and dikes with their subsequent breakthrough etc. (in Stebnik, Alma-Ata and Sargazan).

Candidate of Geological and Mineralogical Sciences I.N. Yanitskiy thus feels it is essential to make immediate changes in the standard documents for the construction of nuclear facilities.

But Goskomgidromet [State Committee for Hydrometeorology], so dear to our hearts, is "stung" by the difficulties associated with preparing technical-standards documentation and the performance of special scientific-research work to study the hydrometeorological conditions of the regions where nuclear power plants are located, along with the lack of special equipment and materials.

The construction of the exceptionally expensive nuclear power plants for heating supply (AST) in Arkhangelsk, Gorkiy and Voronezh is eliciting particular alarm. These plants are located in the immediate proximity of the cities. The entire enormous industrial city falls into the thirty-kilometer zone in the event of a catastrophe at the Gorkiy AST, which would in fact signify a crushing blow to the country's industry overall. An accident in Voronezh would deprive us, aside from vitally important industrial enterprises, of some excellent farmland in this era of the food program.

It is curious that not one of the senior officials of the Chernobyl agencies can explain himself satisfactorily on the score of alternative versions of heating for Arkhangelsk, Voronezh and Gorkiy.

The circumstance that an AES cannot be constructed near enterprises of the chemical industry, TESs [thermal electric power plants] etc. is moreover not taken into account at all in a number of cases.

An especially dramatic situation has taken shape in Balakovo in Saratov Oblast. Many types of large-scale chemical production (plants producing phosphorus and rubber goods, among others) are concentrated in a city with a population of 200,000, and there are a good fifteen enterprises operating there that cannot be halted in the event of an accident. The AES is located literally a hundred meters from the Volga and 8-9 kilometers from Balakovo, which is a gross violation of the standards for the positioning of AESs.

The Balakovo AES is moreover potentially subject to flooding in connection with a possible accident at the Kuybyshev GES [hydroelectric power plant], even though it already, figuratively speaking, "up to its knees in the water"—the groundwater runs too shallow there.

Finally, the grounds of the AES are above the source of drinking water from which the whole city is fed.

Notwithstanding all of this, the senior officials of the Chernobyl agencies are proposing to augment the capacity of the Balakovo AES—they are adding on a fourth power unit in fire-drill fashion and planning the construction of a fifth and sixth unit, facilitated all around by the favorable financing of the project.

It is obvious that our senior officials are simply unable to absorb such concepts as the "ecological capacity of the region."

Such a policy for locating nuclear-power facilities cannot be evaluated as other than exceptionally harmful.

Condition not met.

Condition Five

Constant Ecological Monitoring

The sacred incantation of our senior officials rings in all our ears: the AES is ecologically cleaner in normal operation.

Unfortunately, it does not seem possible in practice to find out how often our AESs operate "abnormally," and an extra-departmental and moreover independent and honest office whose staffers would at least have no vested interest in deceiving their countrymen is required to uncover the true state of affairs.

We essentially do not know what the "norm" is, that is, the norm for emissions that are hazardous to peoples' health. But that is not even the issue: we simply have no way of measuring these emissions even though, as is asserted in the pages of PRAVDA (15 Oct 89) by the former director of a certain nuclear institute and, at the same time, the former editor-in-chief of the journal ATOMNAYA ENERGIYA, O.D. Kazachkovskiy, "AESs do not emit anything." (The doctor of physio-mathematical sciences evidently forgot what he was taught in the institute over the years of his service in the nuclear agency.)

The problem of monitoring radiation, which was being strongly felt even before Chernobyl, is currently becoming much worse: the set of instruments is far from complete, and the instruments that do exist do not meet contemporary international requirements. The development of ecological strategy should moreover be conducted in comprehensive fashion, on the plane of studying both the radiation and the chemical situation; comprehensive ecological monitoring, in other words, is needed.

As the specialists affirm, it is not enough to record the radionuclides, it is also essential to determine what chemical compounds they are present in and what their phase state is. We are unfortunately not equipped with such instruments.

A regard for the interaction of factors of chemical and radiation pollution of the environment is essential, at least because the so-called "synergism" effect exists. In other words, even if the chemical and radiation pollution of the environment taken separately do not exceed stipulated (By whom? When? On the basis of what scientific data?) levels and are "safe" in and of themselves, their combination produces a "fulminating" effect. Two times two, under conditions of synergy, will not equal four, but rather, say, nine; that is, the negative impact of each of the elements is strengthened many times over.

The slightest rise in radiation is for that reason terrible under conditions of the almost universal chemical pollution of our habitation environment. Growth in chemical pollution under the conditions of enhanced background radiation is just as terrible. And we do not have enough dosimeters, not to mention spectrometers, and those, as they say, are past their prime. This was mentioned in particular at the 1st USSR Congress of Radiobiologists that was held in Moscow of August of this year by Candidate of Technical Sciences A.I. Glushchenko.

And here is the problem of the infamous glasnost once again. It is well known, for example, that a so-called "little obkom" is operating within the confines of Sverdlovsk Oblast where information is gathered on the radiation situation at the Beloyarsk AES. God only knows what goes on behind the closed doors of the "little obkom." There is definitely no official opportunity of finding out that a "standard" for radiation pollution exists and what it actually is, not to mention the realities of the radiation, chemical and other pollution in the region. And that would be extremely interesting, since the "little obkom" is informed on the ecological situation in the region, where a fast-neutron reactor is being operated, which no one besides us and the French are operating and with which they intend to equip the South Urals AES that is under construction. What then, there is an underground obkom in operation?

Condition not met.

Condition Six

Presence of an Effective System of Health Care

The medical problem of Chernobyl is a topic for very long discussion, and probably more than one. We will not be verbose—we will just cite the words of USSR AMN [Academy of Medical Sciences] Vice President L.A. Ilin that were spoken at a hearing on the medical problems of Chernobyl at committees of the USSR Supreme Soviet on 19 Oct 89 held at USSR Minzdrav [Ministry of Health]: "We are just as ready for a new accident at an AES as we were at one time for Chernobyl." A valuable acknowledgment, especially if one takes into account that Academician Ilin has no vested interest whatsoever in laying it on too thick. And it is worth remembering in this regard that our practical medicine proved to be unprepared to eliminate the consequences of Chernobyl namely through the fault of L.A. Ilin and A.K. Guskova (at the time the chief radiologist of one of the administrations of USSR Minzdrav).

It was their fault that there were no iodine drugs—which began to be distributed to the population only a week (!) after the accident, that is, when it was already too late—in the stricken zones, that there were no respirators, dosimeters or suitable footwear and clothes. And that must be stated frankly. And doesn't that conceal the cause of the "prettifying" of the medical problems of Chernobyl on the part of the leadership of the Institute of Biophysics of USSR Minzdrav and Goskomgidromet?

The residents of Mogilev, Gomel, Zhitomir, Bryansk and number of other oblasts proved to be in a disastrous situation. The appropriate medicines are lacking; three years after Chernobyl it has become clear that it is now simply impossible to live in many regions. This was

discussed at the USSR Congress of People's Deputies as well. But there are, according to official data, no funds for moving people out.

Perhaps human life is really not a subject of prime importance?

Reports have been appearing in our press recently that the "majority of those who were working in the stricken zone about three years ago have not undergone clinical medical observations," and that many who received a dose of radiation "have not ascertained the link of the 'cluster' of illnesses with ionizing radiation or at least with the participation in work on eliminating the consequences of the accident." An enormous body of people has been tossed to the whims of fate.

The monopoly right to establish the link of illnesses with ionizing radiation has been reserved for itself by the Institute of Biophysics of USSR Minzdrav headed by L.A. Ilin, or more precisely the special commission of that institute headed by Professor A.K. Guskova and consisting of ten members.

More than 200,000 people passed through Chernobyl, according to the data of B.Ye. Shcherbina (POLITICHESKOYE OBRAZOVANIYE, No 10, 1988), while a different figure, three times as large, was heard at the 1st USSR Congress of Radiobiologists. The consequences of Chernobyl have been suffered principally by young and healthy people.

Now let's try to solve a simple arithmetical riddle:

"How much time will be required by the Guskova commission to uncover the 'link' between illnesses and ionizing radiation for the at least hundred thousand people who at one time or another will have a health complaint for the purpose of being paid the appropriate compensation, if you take into account that the case under study must have been confined to a clinic for no less than a month?"

And a second question:

"Why has the right to establish a 'link' not been granted to the conventional VTEKs [medical commissions for the determination of disability], or at least those teams of radiobiologists and medical workers who have been working in the stricken zones and have accumulated sound knowledge and experience?"

Perhaps so as not to pay people compensation?

It should be noted that all of this is being implemented in accordance with the instructions of USSR Minzdrav. They state in particular the necessity of classifying as secret information on the accident at the Chernobyl AES and the results of treating the victims, as well as the extent of radiation injury to the personnel that took part in eliminating the consequences at the plant. This was also discussed in the "Viewpoint" program of 7 Apr 1989, as well as an article by USSR People's Deputy A. Yaroshinskaya published in NEDELYA No 30 for 1989.

All of this cannot help but give rise to a feeling of legitimate indignation among people.

The question arises of whether we have the right to develop nuclear-power engineering if our medical care is not only unable to protect the health of our people, but is not even oriented toward it, and if the state of our finances does not permit the pursuit of measures to protect the population. But why then do we have enough money for the construction of new and ever more expensive AESs?

And what medical assistance for the population in the event of a nuclear accident can we be talking about if our pharmacies—even the Moscow ones—have recently been out of even the most rudimentary medicines? Will we hope that "Europe will help us"?

Condition not met.
Condition Seven

The Social and Legal Protection of the Population

The population living near an AES, in the opinion of Professor Yu.I. Koryakin, must now be compensated for the inconveniences associated with such a dangerous neighbor (as is done in the countries of East and West). The institution of differentiated beneficial rate scales for heat and electric power, tax privileges depending on the distance from the AES, economic compensation for the inconveniences of the operation of nuclear facilities and payments to local budgets for radioactive emissions and thermal discharges on a proportionate scale are essential.

The necessity of the most rapid possible adoption of a Nuclear Power Law—called upon to regulate the construction and operation of nuclear facilities and which would be developed under conditions of glasnost and skilled parliamentary and nationwide discussion—has become acute.

Also essential for the purpose of ensuring the safety of our society and state are:

—the immediate abrogation of existing departmental censorship, thanks to which the GKAE effectively blocks the dissemination of true information both on the Chernobyl accident and its consequences and on nuclear power in general;

—the removal of all bans on ecological information, including information on the radiation situation in the country, since the failure to know it is leading to grave consequences for the population;

—the assurance of the mass output of individual dosimeters. The question of providing the population with dosimeters is entirely solvable—almost every Soviet family has a television, a device a million times more complicated than a dosimeter instrument;

—the performance of public expert ecological analysis of the existing plans for nuclear-power facilities independent of the nuclear agencies. Any plan should, before its approval at the corresponding levels of authority,

be subject to public expert analysis; the public ecological commission should have the right to a conclusive "veto" of it. The decision to construct an AES could be made only after a positive resolution by referendum.

The existing system of expert analysis should be abolished, since organizations that are mutually dependent and have a vested interest in "moving things along" are active in it. This vested interest and interconnectedness in practice turn into the acceptance of plans that are ruinous to society and the state; and

—well-defined and clear-cut legislation on nuclear-power engineering and an intolerance of the creation of laws by agencies are essential. The construction of nuclear-power facilities (AESs, radioactive-waste burial sites etc.) should be conducted only with the consent of the population of the region in which it is being proposed.

Our peoples' consent is unfortunately still not asked when locating nuclear facilities near their residences. It is another matter when the issue concerns cats and dogs. In the RSFSR, as is well known, the "keeping of dogs and cats... in apartments occupied by several families" is permitted "only with the consent of all those residing there" (Clause 1.2 of "Rules for the Keeping of Dogs and Cats in Cities and Other Populated Areas of the RSFSR").

The publishing of all agreements concluded between the USSR and foreign countries in the sphere of collaboration in the realm of utilizing nuclear power and, in particular, nuclear-power engineering, is essential for the purpose of cutting off any kind of secret departmental diplomacy that could inflict harm in our people and state; the international activity of our nuclear agencies should be placed under strict parliamentary and public monitoring.

The most rapid possible legislative ban on the disposition of radioactive wastes from the nuclear power plants of foreign countries on USSR territory is essential.

People themselves should determine the extent of risk acceptable to themselves, and they should be active subjects in the process of adopting the cardinal socio-economic and technological strategies, not the objects of manipulation by the interested agencies.

Condition not met.

Condition Eight

Public Trust in the Initiators of Nuclear-Technology Development

The signature of the aforementioned Academician A. Ilin, along with that of Yu. Izrael, are on the conclusion of the experts of the Governmental Commission on the Causes of the Accident at the Chernobyl AES, which states that the total emissions of fission products (FP) was 3.5 percent of the total quantity of radionuclides in the reactor at the moment of the accident. (Proceeding from these data a computation was made from which it follows that the reactor discharged about 63 kg [kilograms] of FP.)

However, as becomes clear from the "Chernobyl Notebook" of G.U. Medvedev (NOVYY MIR, No 6, 1989), about 50 tons (!) of nuclear fuel (that is, about 28 percent) was discharged into the atmosphere and evaporated (!). About another 70 tons of fuel were discharged from the peripheral sections of the reactor core (p 36). This means that the reactor spewed out about 500 kg of plutonium.

And let our nuclear-power people explain the physical nature of this explosion; there are extremely differing opinions on that score.

So then, about 120 tons of fuel were discharged from the destroyed reactor, with a load equal to 180 tons, that is, about 70 percent. Seventy, not 3.5!

The experts of the governmental commission, which also included VNII AES Director A. Abagyan, Yu. Svintsev, V. Sukhoruchkin, the current chairman of the GKAE, A. Protsenko, I. Kuzmin, A. Khrulev, A. Guskova, O. Shakh and many others, diminished the data on the catastrophe by 20 times! In other words, they lied to the country in the most obscene manner, repeating over and over that in essence nothing terrible had happened.

Another world record for lies was set on 6 May 86 at a Moscow press conference by Yu. Izrael, Yu. Sedunov and B. Shcherbina, who diminished the radiation level in the region of the damaged unit by six orders of magnitude, that is, a million (!) times (*ibid.*).

Prior features had already mentioned the fact of the phenomenal coincidence of the estimates of Soviet and American specialists on the score of the magnitude of the emissions of radioactive substances from the destroyed Chernobyl reactor (50 and 80 million curies respectively). Taking into account the new information gleaned from Medvedev's "Chernobyl Notebook," it only remains to be staggered at how these gentlemen from the Livermore Laboratory and the comrades from the Kurchatov Institute managed to put their finger in one and the same hole in the limitless heavens—the one proceeding from objective indicators and the other from falsified ones. (Recall that even if the data had differed by 4-5 times, that would have been an unheard-of coincidence.)

But perhaps there was some understanding between our nuclear-power people and the Americans? And could we trust them after all of this?

Condition not met (?).

* * *

And so, in the first approximation we have counted fewer than ten conditions (in reality there are many more of them) that are essential to the normal development of nuclear-power engineering, each of which is decisive in

and of itself. The failure, in other words, to meet even one of these conditions, in our opinion, makes the development of nuclear-power engineering impossible.

The question of responsibility for something that has been done under our system is often posed in classic fashion: who, they say, was at the switch? The dead operators and the surviving director and chief engineer were declared the switchmen after Chernobyl. This distribution of the blame is evoking the legitimate indignation of the operational personnel of our AESs.

But we fully have the right to ask, What should be done with the "senior switchmen"—Aleksandrov, Ilin, Izrael?

And what is to be done then? Close down this nuclear-power engineering, or are other compromise solutions possible, and if so, what are they?

Today one can hear voices (quite rare, by the way) that it would be most sensible to take a 15-20-year pause in the development of nuclear-power engineering and utilize it to create new and more advanced reactors—reactors of a new generation with enhanced safety—and to develop safe and maximally economical technologies for the dismantling of AESs and facilities in the nuclear-power complex, as well as to solve the problem of radioactive wastes with high specific activity. No one, after all, will vouch for the fact that we have no need of nuclear-power engineering. This viewpoint was expressed by Professor Yu.I. Koryakin and Doctor of Technical Sciences Ya.V. Shevelev. This is, in my opinion, a very sensible stance. I cannot fail to note, however, that it is, judging from my own observations, just the partial stance of these authors, and Yu.I. Koryakin, judging from everything, has long been among the "dissidents" at Minatomenergoprom [Ministry of Nuclear Power Engineering and the Nuclear Power Industry].

And of course, the next 15-20 years should be used for improving medical care for the people and raising the degree of their social and legal protection.

We have squandered our lands for centuries eternal, with no hope whatsoever of healing them, as a result of the Chernobyl catastrophe. But if matters proceed in this manner in the future as well, and a catastrophe similar to Chernobyl is inevitable under the conditions of our life—recall at least Chelyabinsk in 1957—then one not-so-fine day we will discover to our surprise that our land has "died" and that we will have to resettle where the "enlightened nations" let us if, of course, they do let us.

Question: do we have the right to develop nuclear-power engineering if we do not know how to restore destroyed ecosystems?

We are also entitled to ask ourselves whether it is worth spending absurd amounts of money on scientific developments in the realm of nuclear power and its technical retooling, or whether it would make more sense from an economic and socio-political viewpoint to invest that same money (if not less) in such extraordinarily promising realms of power engineering as the creation and incorporation into series production of gas-turbine and steam-turbine power installations, the utilization of the incalculable reserves of Kansk-Achinsk coal to obtain an ecologically clean fuel—methane—via underground coal gasification, the utilization of modular GESs [hydroelectric power plants] etc.

This strategy, taking into account the great inertia of the power-engineering system, must be devised here and now, instead of patching the holes that are appearing endlessly in the rotting cloth of our nuclear coat. The more so as the share of nuclear-power engineering in the country's overall power system will barely surpass 15 percent under the conditions of ecological and geological-engineering procedures.

In short, even "little" nuclear-power engineering requires colossal sums of money. Perhaps it would be better, then, to choose a different energy strategy?

We cannot forget that strict and responsible technologies cannot be developed in a society standing in endless lines for everything, in an irresponsible society.

Such a society imposes strict limits on the development of contemporary technologies, the upper and lower bounds of which are determined by big and "little" catastrophes.

"To make rabbit stew," says the French proverb, "you first of all must have a rabbit, or at least a cat."

Our Chernobyl "benefactors," alas, have neither a rabbit nor even a cat on hand, and so they are making us a stew from dead rats.

Perhaps it is time then to understand that Russia is not a proving ground for irresponsible experiments?

Domestic Radiation Measuring Devices To Be Sold

904E0050A Kiev PRAVDA UKRAINY in Russian 8 Dec 89 p 3

[Article by D. Kiyanskiy, RATAU correspondent: "The 'Desna,' 'Pripyat' and Others"]

[Text] Specialists of the UkSSR Academy of Sciences have developed a number of instruments to detect radioactive contamination.

No matter how much they say that the curtains of secrecy created by the interested departments around the Chernobyl catastrophe no longer exist, the doubts of many thousands of people will be dispersed once and for all only when they can measure with their own hands the level of radiation on the street, in the yard, and in the apartment, and are convinced that the radionuclide content in products bought at the store or at the market

corresponds to the sanitary norms, and the rayons designated as "clean" on the map of the distribution of radioactive contamination really are that way.

This will become possible after household and professional radiometers developed at the Institute of Nuclear Research of the UkSSR AN [Academy of Sciences] are put on sale. A number of Kiev enterprises have been instructed to issue them.

The institutions of the UkSSR Academy of Sciences began to develop them as early as 1986. The instruments to measure beta-radiation—radiometers, as distinct from dosimeters—make it possible to detect the source of contamination more accurately, and, particularly important, to determine the amount of radionuclides in food products and water.

This is precisely what distinguishes the "Beta." The new portable radiometer is completed by a little 18-kilogram lead "house"—to monitor the radiation contamination of products. In 1987 the Institute of Nuclear Research of the AN UkSSR manufactured a test batch—250 radiometers, which were turned over to the Ministry of Health and Gosagroprom of the republic. At that time the Etalon plant began series production of these instruments. They are now, in particular, being successfully used at Kiev markets.

Physicists are continuing to improve their offspring. Even though the next model—the "Beta-4"—can be easily put in your pocket, a microcomputer is built into it, through which the radiometer itself makes all the calculations and immediately shows the amount of specific radioactivity of the sample. The new instrument is designed mainly for dairy farms and meat combines.

The portable "Desna" radiometer serves to monitor radioactive contamination on the territory. It measures gamma- and beta-radiation and shows the contamination of the surface with beta-active radionuclides. Its advantage lies in its tremendous range. While instruments existed in 1986 as equipment for the personnel of the Chernobyl AES, after the accident they simply had off-scale readings, but this one can measure a level of from 10 microroentgens to 2000 roentgens an hour.

There are four portable instruments laid out on the desk—each one smaller than the other. We have already spoken about three of them. The fourth—the most miniature (it weighs about 300 grams) and the least expensive—will cost up to 100 rubles. The new, individual radiometer for the people, developed in 1989, passed its tests successfully and by resolution of USSR Gosstandart was included in the State register as a measuring device. The "Pripyat" fixes gamma- and beta-radiation—in other words, the background and radioactive contamination of a surface. But that is not all. It can serve as an indicator of product contamination: it accurately shows a large dose, and with less accuracy, the negligible dose corresponding to the permissible level. The miniature radiometer operates on Krona type batteries or from a wall outlet. Its series output has been entrusted to the Kiev Arsenal Plant Production Association imeni S.P. Korolev, to which the republic Academy of Sciences has turned over its technical documentation.

The AN UkSSR, in conjunction with the Ministry of Health, has drawn up a handbook for dosimetric monitoring, which gives recommendations on how to use the instruments.

Specialists Polled on Attitudes Toward Nuclear Power

904E0050B Moscow NTR TRIBUNA in Russian
No 22-24, Dec 89 p 6

[Article by F. Rossels, candidate in Philosophical Sciences, scientific observer for NTR: "At the Crossroads of Opinions"]

[Text] **Fifty highly qualified experts, whose professional activity is closely connected with nuclear power engineering, were queried within the framework of the sociological study, "Public Opinion on the Construction and Operation of Nuclear Power Plants."**

This study is the fruit of the joint efforts of the Interdepartmental Council on Information and Public Relations in the Sphere of Nuclear Power, of the Institute of Sociology of the USSR Academy of Sciences, the Mosintek State Cooperative Association and the editors of our bulletin. As we have already reported (NTR, No 13, 1989), the study includes three units: mass questioning of the inhabitants of places where construction of nuclear power plants for heat supply (AST) is either in progress or proposed, questioning of formal and informal leaders of public opinion in these regions and, finally, the questioning of experts, i.e., specialists with higher qualifications, who develop, operate or support—in scientific, medical, economic, and other respects—power engineering facilities.

So far only the questioning of the experts has been completed. Among the 50 persons who filled out the specially worked out questionnaire, were 14 academicians and corresponding members of union, republic and sectorial academies, 24 doctors and 5 candidates of sciences, 5 directors of union departments and their deputies, 8 directors of major research and design organizations and chiefs of divisions, departments and laboratories of leading institutes. Forty of those questioned represent physics, chemistry and technical sciences, and 10—economics, radiobiology and radiation medicine. All have a long period of service and experience in their work in nuclear power engineering or fields related to it.

We have already published some of the answers obtained, together with the expanded commentaries of their authors, under the rubric, "Vzglyad na atomnuyu energetiku" [A Look at Nuclear Power Engineering]

(NTR Nos 14-16, 19)—as a matter of fact, it was from these precise materials that the rubric began. While before, however, we granted the floor to individual experts on the problems closest to them, we are now submitting for the judgment of the readers the combined information correlating the standpoint of specialists on a certain specific question.

The content of the questionnaire was broken down into five parts. These are questions determining the general attitude of the expert toward nuclear power engineering and its perspectives, the arguments "for" or "against," nuclear power engineering and glasnost, and, finally, the problems of the safety of the Arkhangelsk, Bryansk and Voronezh AST. We present below the distribution of expert opinions on the most interesting questions of each group, having provided a brief commentary for the corresponding table.

Finally—despite the quite broad range of opinions expressed, one must still not forget that they are mainly the opinions of people in one way or another connected with nuclear power engineering, and perhaps, to a certain extent, prejudiced. Realizing this, the editors intend to print, as other units of sociological research are completed, the results of the questioning of leaders of public opinion—quite a few of them are participants in the "green movement"—as well as the results of the mass questioning of the population.

Table 1

On the whole, what is your attitude toward nuclear power engineering?	%
I am a staunch supporter of nuclear power engineering	46
I am a supporter of nuclear power engineering, but with certain reservations	28
I am against the present strategy of developing nuclear power engineering, and I have my own idea on that subject	18
Other answers	14

Note: The total number is over 100 percent, since some experts selected two answers

As can be seen from Table 1, even among professional nuclear scientists, less than half of them are unconditional supporters of nuclear power engineering. It is not difficult to understand what the matter is, for this it is enough to ask the question: how would this table have looked before April 1986, i.e., before the Chernobyl catastrophe? The answer, I think, is clear—there would have been many more adherents of the "peaceful atom." Now, however, most of the provisos suggested by those participating in the questioning in one way or another involved increasing the safety of nuclear power plants.

These include the development of self-stabilizing reactors with increased reliability, which shut themselves off at the slightest deviation of the technological process from the assigned parameters, protective shells over the reactors, which do not permit, even in case of an accident, emission of radioactivity beyond the limits of the plant, a radical improvement in training personnel on the basis of the most modern training simulators, solving the problem of locating the reactor—underground or in remote areas—and many other suggestions, which must be carried out, for specialists to permit further development of nuclear power engineering.

Table 2

If you have definite doubts as to the correctness of the present strategy for developing nuclear power engineering in the country, which path to ensuring safe operation of nuclear power engineering facilities seems most sensible to you?	%
To have a pause in the construction of AES, ATETs and AST until a major solution is found to the basic problems involved in safe use of nuclear power engineering	22
To slow down the construction of nuclear power engineering facilities, using the resources freed to solve the problems involved in ensuring safe operation of AES, ATETs and AST already existing, and future ones	38
Without stopping and without slowing down the construction of nuclear power engineering facilities, solve safety problems at the same time, substantially increasing allocations for this purpose	34
Any other suggestions	36

Note. The total number is over 100 percent, since some experts selected two answers

The word "safety" literally permeates all of Table 2. It is in the formulation of the question and in each variant of the answer. The fact that 60 percent of the experts feel it necessary to slow down or even stop construction of nuclear facilities and concentrate on solving the problems of their safety once again emphasizes the concern of specialists and their striving not to permit another Chernobyl nor even a hundredth or thousandth fraction of it.

I think that there should be even more supporters of the pause. True, there are two points of view on this score. According to one—the already existing and especially the future energy shortage may be covered only by means of nuclear power plants. According to the other—the energy shortage in the country is imagined, and all our needs can be fully satisfied by energy conservation.

The supporters of energy conservation as a rule allude to the United States, emphasizing the fact that there the energy-intensiveness of production is much lower than in the USSR, i.e., energy is used much more efficiently. At the same time, however, they seemingly fail to notice that, in the first place, 2.5-fold more energy—the very thing that is used efficiently—is still required there than in our country, and no matter how much energy we save, there will not be any more because of this. In addition, even under the conditions of the high standard of American production—it is here, and not in everyday life, that the basic sources of energy conservation lie—mass transition to energy-saving technology has taken 10-15 years. One can hardly really hope that in our country, especially under today's conditions, it will take place more quickly.

Obviously, therefore, the idea of the "gas pause" enjoys great popularity among specialists. This idea has already been discussed on the pages of NTR (No 22, 1989). It can be added that now, when reliable technology has already been developed for relatively ecological and highly profitable steam-gas units (PGU), it has more and more adherents every day.

Table 3

The structure of nuclear power plants for heat supply (AST) ensures increased safety, sufficient for them to be located near large cities	%
The argument is fully substantiated	44
True, with certain reservations	30
There is no scientific information confirming or refuting this argument	2
The argument is not completely true	8
The argument is absolutely false	4
No answer	4

On this subject (see Table 3), in contrast to the preceding, the opinions of specialists were by no means so unanimous. Above all, AST are new, and, in contrast to the usual plants with RBMK and VVER [water-moderated water-cooled] reactors, have been virtually unproven so far. Hence—one-tenth of the experts feel that they do not have enough scientific information for an adequate evaluation (and without it—what sort of experts are they?).

Meanwhile, this is the precise situation which I ran into at a recent All-Union Applied Science Conference, "Nuclear Power Conservation and Ecology." It was held in Voronezh, where an AST has been under construction for several years. Public opinion directed against this construction has recently been sharply activated here. (Incidentally, the question on the potential danger of the VAST [Voronezh AST] was also in the questionnaire for the experts, and only 30 percent of them answered that in their opinion, no such danger exists).

I do not wish to touch on the sharp polemics that arose at the conference on questions such as how necessary additional energy was in general for the city or whether they could get by with energy conservation, or how well-founded had been the manner in which the site for the plant was selected. This is what is interesting. Most of even the active opponents of the construction—I have in mind primarily the nuclear power and power engineering specialists, etc.—readily acknowledged the high reliability of the structural designs of the AST, and agreed that this is a new generation of reactor, with a safety level theoretically much higher than all the preceding structures. But precisely, theoretically. From the standpoint of practical work, there is great distrust among those very people who challenged the quality of the construction, the reliability of individual parts and, the main thing, the lack of results of the tests of the AST as a whole structure—thorough stand testing of individual units and assemblies of the reactor was considered insufficient.

Table 4

Even with the presence of the safe operating technology of nuclear electric power plants, the lack of discipline, slackness and criminal willfulness of the personnel (as there was at the Chernobyl AES) can lead to dangerous and even catastrophic consequences	%
The argument is completely well-grounded	46
True, with certain reservations	30
There is no scientific information confirming or refuting this argument	2
The argument is not completely true	14
The argument is absolutely unfounded	4
No answer	4

Of the eight arguments directed against the construction of nuclear power plants, the argument presented in Table 4 was considered by the experts to be the most well-founded. The experts do not consider the rest of the counter-arguments related to the ecological danger from nuclear power plants and fuel plants, outside of accidents, to be sufficiently serious. The terrible shadow of Chernobyl, resulting from the imperfection of the structure of the RBMK reactor, however, and the consequence of the series of incorrect actions of the personnel, in many ways increases the feeling of potential danger from any nuclear power engineering facilities.

Today the attitude toward man as a participant in modern technological process is ambiguous. On the one hand, he is the one who may be the weakest spot in the technological chain. On the other hand—in an unforeseen, so-called "unplanned" emergency situation, when there is no clearly worked out algorithm for action, it is man alone who becomes the last hope.

Hence, in the first place, the striving to create a structure so that it itself would block the incorrect decisions of the operator—be equipped with multiple, as they say, "protection against fools" and moreover, one that in case of any deviations from the normal flow of the technological process would immediately shift to a decelerating mode. (Plus, naturally, external protection—a hood over the reactor, underground location of the plant, etc.).

In the second place—the maximum attention to personnel training. Training simulators, working out dangerous situations, every conceivable and inconceivable type of failure and independently—social-economic and psychological support. At the Voronezh conference, one of the speakers said that in America the wages for an AES operator were higher than the president's. Then, true, it turned out that they were lower, but—not much. This is payment for reliability, and for responsibility.

Table 5	
Have you observed any shortcomings in the coverage of the accident at the Chernobyl AES in the Soviet mass information media?	**%**
Yes	88
No	8
No answer	4

As was mentioned, no comments were required for Table 5. I cannot restrain myself, however, from speaking of the tragedy of secrecy. Probably no one has yet calculated—and they do not know whether they will ever calculate—what, how much money and how many victims the system of total secrecy, existing until only very recently, has cost our government.

Sometimes it occurs to me that while the Chernobyl tragedy is judged to be over, suppose it had happened two, or better, three years later. Right now many are trying to discover the person or persons responsible for concealing the true information, particularly in the early period after the accident. I think that is not what they are looking for. It is not possible to find the one who concealed the data—this was done by the entire system, and the inertia of those ideas according to which almost everything connected with the word "isotope" automatically fell under the strictest stamp of secrecy—but the one who at that time could not bring himself to disclose these "forbidden" data. I also think how much easier this would have been to do now, and how many tragedies could have been avoided by this.

Monetary Compensation for People Living Near AES Proposed

904E0043A Moscow IZVESTIYA in Russian
3 Jan 90 Morning Edition p 2

[Article by IZVESTIYA science columnist S. Leskov under the rubric "Commentary by Our Columnist": "Nuclear Power Plants: Compensation for Risk"]

[Excerpts] *They were scarcely able to hold meetings and assemblies in the first hours of the new year demanding the closing of nearby nuclear electric power plants [AES]. But the fact that no few of them will be held at various points in the country in 1990 can be boldly predicted.*

Many regard living in the area of an AES today as a frivolous feast in a barrel of gunpowder. And that is in the face of the fact that nuclear power engineering in the USSR holds a quite modest place—just 12 percent—in our electric power engineering. That figure, by way of comparison, is about 30 percent in Japan and West Germany, 45 in Sweden and 73 in France. Even the projected levels are not being reached in the USSR, by the way. The plan for 40 million kilowatts of new AESs for the 12th Five-Year Plan was reduced to 30 million after Chernobyl, and the actual figure will not exceed 15 million. But the public revolt is growing nonetheless, and the "greens" are seeking practically the complete rejection of nuclear power engineering.

It could, of course, be rejected. But those same "greens" are also persistently demanding the saving of the environment and the resolution of ecological problems. The ozone hole, the greenhouse effect, acid rain and ash emissions are the inevitable fellow-travelers of all types of fuels. All except AESs and... firewood. But according to the calculations of Doctor of Physio-Mathematical Sciences I. Belousov, it would be necessary for millions of people to work in logging and millions more in planting new timber to provide the USSR with the essential quantity of firewood. The AESs are what is left...

[passage omitted]

Fear of radiation is a biological feeling, it is as inevitable for a person as the desire to avoid darkness. You can't fight radiophobia, but you can be reconciled to it. Payment for the risk and inconvenience of proximity to an AES thus seems a humane and entirely natural step. The creation of such conditions that the AES becomes economically advantageous for the population of the given region is the practice of many countries. Powerful plants are built here, and a considerable share of the electric power is transmitted for free to neighboring regions, even from industrially developed regions (the Balakovo and Zaporozhye AESs, for instance). The flip side of such generosity and lack of ownership is the surprising remove of the agencies from various miscalculations and accidents even on the scale of Chernobyl.

The idea expressed by Doctor of Economic Sciences Yu. Koryakin for the development of special material-compensation steps for the inhabitants of AES regions thus seems exceedingly sensible on this plane. Rate scales for payments for electric power and heating supply are set depending on distance from the plant. The profits received by the local soviets could be directed toward the construction of orchards and roads or the development of the infrastructure of the region. Rough economic estimates show that favorable rates could provide the region with hundreds of millions of rubles a year.

Professor Koryakin's idea is unfortunately not reflected in the draft Law on the Utilization of Nuclear Power in the USSR. There are many other things lacking in that draft as well, although there are more than enough general declarations. It is clearly not by accident that this draft has been circulating among various offices for years now. And laws on nuclear power engineering were, after all, adopted two or three decades ago in most countries.

The 2nd Congress of People's Deputies has charged the corresponding agencies with concluding work on the draft law over 1990. It is clear, in any case, that the substance of the law should respond to the democratic changes in the political and economic structures in all of society. But the too-great independence that the locals soviets could receive evidently has some leaders on guard today. The processes of restructuring envisage the

decentralization of management, and the nuclear industry cannot lag behind other sectors. Centralized rates for power are clearly an anachronism. And restructuring in the sector has been limited thus far to the merging of two large ministries into an even bigger and more omnipotent one—Minatomenergoprom [Ministry of the Nuclear Power Industry].

Every nuclear power plant is regarded by the populace as it was before, an alien tree being planted on local soil from the corridors of power in the capital. Until the situation changes, until people obtain the opportunity of determining the future of their own region, an irreconcilable confrontation surrounding nuclear power plants is inevitable, and the number of meetings on the problem of AESs will only grow in 1990.

Need for AES Employee Organization

904E0039A Moscow TRUD in Russian 27 Dec 89 p 2

[Article by V. Kurkin, candidate of law: "System of Protection"]

[Text] **Imagine that you are visited at home by people in pilots' uniforms. They propose that because the work of Aeroflot is unsuitable to you, a passenger, they are nominating you as a candidate in elections for a new chairman of their union. Surely, the situation is absolutely unrealistic. This is what I said to myself when N. Loskutov and I. Karpov, operators at the Kursk AES, greeted me by saying that as I had written about problems of nuclear power I was being suggested for the post of chairman of their new professional organization, the Association of Operating Personnel at AES of the USSR (AOP AES SSSR). They showed me a draft to the charter and once again, I had to listen to the bitter life of the "priests of the peaceful atom."**

Among the casualties of Chernobyl is the destruction of the stereotyped prestigious image of atomic workers. It shattered the myth about the preparedness of workers, their qualifications and responsibilities as reliable guarantees of our safety. Now we know that more than 60 percent of accidents at AESes are due to operator mistakes. Why are there so many? Are people poorly trained or are there not the conditions for normal work? Perhaps there is some other cause?

Here is what operator A. Samus writes on the pages of MIRNYY ATOM (the organ of the party committee, trade union committee, Komsomol committee and administration of the Kalinin AES): "Sometimes, especially during start-ups, a little problem develops; one gets used to this. Never mind that the plan for our nuclear giant was to some extent obsolete even at the design stage, that equipment is not properly repaired, that instruments are accurate only part of the time—one has to determine why... After all, everything is still working. And the plan is still somehow being fulfilled for the most part..."

As you can see, AESes have not avoided the vices common to our industry. However, "the plan at any price" is one thing at a blast furnace, assembly line or construction project (at times these blow up or collapse, causing injuries and deaths); it is quite another at an atomic boiler. It "does not like" unforeseen conditions. The emergency control system goes into operation immediately. However, such abrupt halts are harmful to the reactor and to the plan. So, the operator is in the situation of the hero in the folk tale: "If he turns right he will lose his horse; if he turns left—he will lose his head." Sometimes at nuclear power plants this dilemma is solved in the traditional manner—"Perhaps it will blow over," and the emergency protection system is turned off. It did not blow over at Chernobyl...

However, some people know that a year prior to this something very similar happened at the Zaporozhe AES when A. Volkov, the station director, ordered a start-up of the second energy block with all emergency protection equipment disengaged. According to eyewitnesses, "he did everything he could to melt down the reactor's core." They say that only a miracle saved them from catastrophe. After this "feat" the director was honorably awarded a personal pension. Later V. Petkevich, the chief engineer, who resisted the director in every way possible and attempted to switch on all emergency protection equipment prior to block start-up, was deprived of the right to work in the USSR Ministry of Power and Electrification.

The operators' association plans to put an end to such practices. With this in mind they are reviewing the charter provisions on disciplining nuclear power plant workers. An operator should know that when he refuses to obey an order from superiors to disengage the emergency protection system he will be protected by the law.

Under the present provisions an operator actually cannot refuse to carry out incompetent instructions from the management. It turns out that highly skilled professionals, independent and creative people who take initiatives, immediately fall into the ranks of the undesirable. An example of this is the attitude towards retired naval nuclear specialists. They have long years of academy training and service on the most modern nuclear ships. However, at the Kalinin AES these people are kept a far distance from key positions. One was given the job of machinist-watchman in the turbine building; another was made superintendent, and a third was made a beekeeper. The fourth person, G. Asinkritov, second rank captain and operator, was asked to leave work because he actively opposed increasing station capacity as he thought it would threaten the environment.

There is a completely different attitude towards convenient people. G. Brugman, head of the Nuclear Safety Department, was "forgiven" when he came to the start-up of Reactor No 2 directly from an alcoholic treatment center.

I recall how during the shooting of the program "The Fifth Wheel" from the Leningrad AES, after looking around so that nobody from the administration would notice them, operators came and asked to say, off the screen, that it was necessary to close the first energy block in order to prevent an emergency. A month later an operator called the editorial office of "The Fifth Wheel" and asked to help organize an extra-agency commission on problems of repairing the first energy block because he was deeply convinced that the agency commission would do everything to embellish the existing situation; he categorically refused to provide eyewash. As they say, any commentary is unnecessary.

The overwhelming majority of operators do not have the opportunity for comprehensive and special training. For the most part they "improve" their skills theoretically, studying all sorts of instructions, rules and flowcharts. They have not had simulators. Because of this they make terrible decisions. The lack of experience is compounded in that information about accidents at our AESes is very hard to get. It is difficult to believe, but even information on accidents at foreign nuclear power plants is classified. As Ye. P Shabalin, chief of the Nuclear Safety Sector at the Joint Institute for Nuclear Research, admitted to me, because information about accidents at nuclear installations was not available to him, he did not know what should be analyzed in his sector.

A World Association of Nuclear Power Plant Operators has already been established. Its founders justifiably assume that radical improvements in nuclear power plant operation are possible only if there is a genuinely global system for information exchange. Their Soviet colleagues are completely in agreement. They want to strengthen international ties and exchange of experiences. They advocate glasnost and close contacts with the public in order to overcome public fear about the "peaceful atom."

Not enough people have any idea of the conditions under which our nuclear workers sometimes live. He is what a worker from the Smolensk AES writes: "What is the reason for our living like cattle in Desnogorsk (345 kilometers from Moscow)? The managers are time servers: one director went to Moscow, another to Cuba, while the third is a person without any basic standards. It is a dreadfully drawn out construction project, without any architectural planning. There are ungainly plans for houses and cultural institutions. There is no stadium or swimming pool; the dirt is terrible. The water is turned off systematically although a nearby settlement and industrial site have three times more than they need.." The association will have something to say about this.

The initiative of the Kursk operators was immediately supported by operators at the Leningrad and other AESes. Only the management at these stations did not take it to heart. At Kursk they even hit upon the idea of cutting off telephone communications with Leningrad. It would seem time for the Central Committee of the Trade Union of Workers at Electric Power Stations and the Electrical Engineering Industry to intervene and cool down the situation. However, in this instance its chairman, N. Simochatov, preferred to maintain neutrality. Although, to give him his due, he is one of the founders of the association and supports the operators. Moreover, he does not intend to violate the USSR Trade Union Charter.

Simochatov explains his position by saying that operators will soon be transferred to Minatomenergoprom [Ministry of Atomic Power] so another union and central committee should help them. This gives the impression that these people are not going to another agency, but to a foreign country. It is still not known when they will be received there, but there is already a rush to disown them. Well, this is additional proof of the importance of the Kursk nuclear workers' idea. The association will close the breach in the system for the social protection of our AES operators during the years of stagnation.

AUCCTU Presidium Examines Worker Welfare Issues

904F0082A Moscow TRUD in Russian 9 Feb 90 p 1

[Article: "In the AUCCTU Presidium"]

[Text] A number of important questions concerned with stimulating the work of Soviet trade unions in protecting the socio-economic interests of workers were examined during a regular meeting of the AUCCTU Presidium.

Approximately 70 billion rubles—such is the budget for state social insurance for this current year. Never before have the trade unions (and they have been managing this budget since the 1930's) encountered an 11 percent increase in just one year. It was noted during the meeting of the AUCCTU Presidium that a number of new social programs of the state are embodied in the budget, programs which were developed upon the initiative or with the participation of the trade unions. This includes raising the minimum pension amounts, removing the "300 ruble limitation" in the payment of pensions to workers and foremen who continue to work, increasing the duration of the partially paid leave of absence for mothers for taking care of an infant up to one and a half years of age, the payment of allowances to families of moderate means for children, not up to the age of 8 but rather up to 12 years of age and others.

However, the income portion of the social insurance budget is very tense and thus the soviets and trade union committees must carry out their work with the insured parties, including cooperatives, in a persistent and purposeful manner. The level of executive discipline must be raised and all attempts by individual trade union organs to retain for themselves considerable amounts of so-called "net surplus funds" and above-plan income must be suppressed in a decisive manner. If this is not done, where will the funds come from that are needed for financing such actions as raising the minimum pensions for the state as a whole?

In view of the difficulties being encountered in connection with passes to the sanatorium and health resort establishments of trade unions (they derive from the large scale of health improvement work being carried out in behalf of the victims of the Chernobyl catastrophe, the merciful assistance being furnished to the homeless following the earthquake in Armenia and other reasons), it is considered advisable this year to authorize the trade union organs, within the limits allowed by appropriations for improving the health of workers and members of their families, to pay a portion of the cost for tourist and alpine passes.

One of the more important operational trends of the trade union organizations, especially under the conditions imposed by shortages in many products, is that of organizing public catering for workers at their workplaces. The Presidium of the AUCCTU has analyzed thoroughly and approved the experience of the Chelyabmetallurgstroy Construction-Installation Association, its cost accounting food combine and a subsidiary sovkhoz.

Here, on a daily basis, hot food is served to approximately 15,000 builders attached to the association and also to 12,000 PTU [vocational and technical school] students and pupils and to more than 13,000 workers attached to other enterprises in Chelyabinsk. The organization of good food services is being provided by 80 dining halls, cafeterias and snack bars. There are warehouses and refrigeration units, four confectionery and fermentation-pickling departments and nine culinary stores. In this regard, a special role is being played by the association's own subsidiary farm, the Solnechnyy Sovkhoz, which supplies the association's dining hall for the builders with more than 300 tons of meat products annually and satisfies completely the requirements for dairy products.

The association's collective displays concern for developing the sovkhoz's logistical base and the social and domestic arrangements for the agricultural workers and this to a considerable degree accounts for a high level of production of agricultural products. Thus, 42 kilograms of meat, 241 kilograms of milk, 144 kilograms of vegetables and 88 kilograms of potatoes are being produced per worker. In addition, the collective is obtaining 4 tons of honey and one half million eggs annually.

Decentralized purchases of products at contractual prices are also being carried out annually in the interest of improving the food situation for the workers. In order to lower the cost of dinners and cover the difference between the purchase and retail prices, the association annually allocates 700,000 rubles to the combine.

Having approved this experience, the Presidium of the AUCCTU recommended that the trade union councils and committees make active use of it for improving the supply of products for the workers, for organizing hot food service for production operations and for transferring worker dining halls over to the balance of industrial enterprises.

In connection with the numerous recommendations expressed during election meetings and also in letters addressed to trade union organs, the Presidium of the AUCCTU has examined and approved the draft law of the USSR entitled "Introduction of Changes and Additions To USSR Labor Legislation." Taking advantage of the right of legislative initiative, the AUCCTU submitted this draft to the USSR Supreme Soviet.

The essence of the AUCCTU recommendations consists of abolishing certain articles contained in the Principles of Labor Legislation for the USSR and Union Republics, in the interest of raising the degree of social protection for manual and office workers in solving labor problems. In particular, a proposal was made to abolish Point 1 of Article 17, which enables an administration to discharge a worker once he has reached pension age, an action which is in conflict with articles 34 and 40 of the USSR

Constitution; Article 18, which authorizes the discharge of a worker in the absence of preliminary agreement by the trade union committee. The AUCCTU proposes to abolish parts 2,3 and 4 of Article 13, according to which a transfer of a worker to another job, even one involving a substantial change in the working conditions, is not considered as a transfer to other work and does not require the consent of the worker and also Part 4 of Article 90 of the Principles, in conformity with which complaints submitted at the end of a year, from the moment that a decision by a court or higher organ concerning reinstatement at work is placed in force, are not subject to review.

A recommendation was made to have the AUCCTU departments, jointly with the trade union councils and committees study and in the near future prepare for submission to the country's higher legislative organs recommendations aimed at further improving labor legislation in connection with implementation of the economic reform.

The Presidium of the AUCCTU has examined the facts concerned with the irresponsible attitude displayed by leading trade union workers in the Maritime Kray towards the organization and carrying out of the trade union cruise to Japan aboard the motor ship Mikhail Sholokov. It was noted that the preparation of the passenger list was in violation of the established AUCCTU system, since it included mainly leaders of economic, soviet and trade union organs, trade workers and workers attached to other organizations in the sphere of services, with workers and trade union activists accounting for less than 40 percent.

Instead of carrying out the important peaceful mission of strengthening friendly contacts with workers attached to branch trade unions in Japan and establishing close business relationships with them, the leaders of the Board of Directors for the cruise, as revealed by a check carried out by an AUCCTU committee, not only did not suppress incidents of poor behavior by participants in the cruise but in fact they themselves behaved in an unworthy manner.

The Presidium of the AUCCTU has noted that the Plenum of the Maritime Kray Trade Union Council, in examining the organization and carrying out of this cruise, did not provide an accurate evaluation of the actions of its leaders and in this regard it passed along a recommendation to the members of the trade union council, the branch committees and the trade union organizations of enterprises and institutions to conduct a repeated examination of the problems associated with the cruise; to furnish a proper evaluation of those incidents marked by a mercenary spirit, the use of official status for personal and selfish purposes by the leading workers of trade union and tourist organs, a loss of trust among trade union members and also to return to the question as to whether or not the deputy chairman of kraysovprof [kray council of trade unions], Comrade V.V. Zelentsov, who was head of the Board of Directors for the cruise, should continue to occupy his post.

It was pointed out in the decree that the chairman of the Maritime Kray Trade Union Council, Comrade V.P. Chubay, is deserving of very strict punishment. But taking into account the fact that he was elected to this position only recently and also that the council's plenum gave him a severe reprimand, the Presidium of the AUCCTU chose to limit itself to the measures already undertaken.

The Central Council for Tourism and Excursions has been tasked with solving the question of punishing those tourist bureau workers in the kray who were responsible for the poor organization and carrying out of the cruise. The AUCCTU has demanded that strict control be exercised over the preparations for and the carrying out of trade union cruises to foreign countries, with special attention being given to the selection of the leaders and those who sign up for the cruise; it has recommended that decisive steps be undertaken aimed at suppressing all attempts directed towards violating the established requirements.

Taking into account the recommendations of the trade union councils and committees, the AUCCTU has approved the principal indicators for the 1990 budget for USSR trade unions, including the plan for membership dues receipts in the amount of 3,542,000,000 rubles. It bears mentioning that 94 percent of these funds remain at the disposal of the primary trade union organizations and territorial branch and inter-union organs. The estimate of the AUCCTU for the trade union budget for this current year has also been approved.

Certain other questions concerned with the social, protective and international work of Soviet trade unions were reviewed during the meeting of the AUCCTU Presidium.

Socialist TU Association Official Interviewed

904F0057A Riga ATMODA in Russian
No 54, 4 Dec 89 p 3

[Interview with Sergey Khramov, member of the Coordinating Council of SOTsPROF [Association of Socialist Trade Unions of the USSR], by Kirill Ilin-Adayev, IMA press: "The VTsSPS Has Died! Long Live SOTsPROF?"]

[Text] **Many skeptics and even some optimists have come to believe in the rapid demise of VTsSPS [All-Union Central Trade Union Council]. Who is ready to come to take its place, though? Claimants, incidentally, have already appeared: independent trade unions in Moscow and Leningrad, in the Urals, the Ukraine and in Siberia. Perhaps the largest of them is the Association of Socialist Trade Unions of the USSR (SOTsPROF), which appeared in April 1989.**

SOTsPROF includes four trade union organizations of Moscow (workers, journalists, students and graduate students, people engaged in intellectual work—the latest one was created in Voronezh). The workers and engineers of

Zaporozhye, and agricultural workers in Cherkassy Oblast have their own trade unions. SOTsPROF is open to the inhabitants of any regions and cities in the country.

Sergey Khramov, member of the Coordinating Council of SOTsPROF, answers questions.

[Ilin-Adayev] What are the tasks of your trade union association?

[Khramov] First of all, we will try to defend the interests of the workers before the administration, draw experienced lawyers into solving conflicts, and look after labor protection measures. Individual collective contracts will be concluded for members of SOTsPROF, and at the same time we retain the right to change their terms—depending on the fluctuation in the price level.

[Ilin-Adayev] The main tangible return from the VTsSPS is remuneration for medical certificates. Will SOTsPROF deal with social insurance?

[Khramov] We feel that the "medical" is not a solution to the problem. SOTsPROF is working out alternative variants. We are also planning to open medical institutions, sanatoriums and rest homes for SOTsPROF members. So far we are not strong enough to take on social insurance cases. That is precisely why we do not require that our members must leave the trade unions of VTsSPS, although there is this trend, and if it keeps up, we will have to establish our own insurance fund.

[Ilin-Adayev] As far as I know, you already have several funds, for example, social protection and charity, created to assist pensioners, invalids and victims of repression....

[Khramov] ...as well as unemployed truth-seekers, who go to the capital to seek justice. We will give them legal support and seek temporary work and shelter for them in Moscow. Again, the fund is supplemented through deductions from various cost accounting organizations. In the near future we plan to hold a charity exhibition of Moscow and Armenian artists in the United States. The proceeds from it will go to purchase medicine and medical equipment.

[Ilin-Adayev] An independent trade union of cooperative operators was recently created in Moscow. What does SOTsPROF expect from this association?

[Khramov] The goal of SOTsPROF is to arrange direct ties between the workers of the State sector and people who are economically free—cooperative operators, farmers and lessors.

For example, we received a number of orders from State enterprises that are interested in improving social-everyday living conditions with our help. At these enterprises SOTsPROF intends to open dining halls and order-stores, and we will begin housing construction. It is the trade union of cooperative operators that will guarantee that our orders are filled.

[Ilin-Adayev] Is the SOTsPROF popular with the workers?

[Khramov] Yes, although, to tell you honestly, they are frightened about entering it: the proletariat has something to lose. The workers come to our meetings when they are convinced that everything is legal, and neither the police nor the KGB are getting ready to break them up.

Another hindrance is the hostile attitude toward the intelligentsia, forced by the organizations like the United Workers Front and certain party directors, who feel that the intelligent people have started stirring up the people and are distracting them from work.

[[Ilin-Adayev] What other trade unions are you planning to organize?

[Khramov] Medical workers, teachers, pilots. In time, railroad workers, miners, metal workers and construction workers will be singled out from the trade union of workers: there may be several SOTsPROF organizations at a single enterprise.

[Ilin-Adayev] How many members does the SOTsPROF have?

[Khramov] It is still too early to say: it has only been going six months. In addition, we are not yet striving for quantity. The VTsSPS has 142 million members—this is absurd! Even the trade unions of China have only 80 million, and the United States—30.

[Ilin-Adayev] Do you believe that SOTsPROF will be able to become as influential an organization as "Solidarity"?

[Khramov] Why not? Some day our society should have a taste for common sense!

War, Labor Veterans Criticize Pension Law

904F0055A Moscow SOVETSKAYA ROSSIYA in Russian 16 Dec 89 Second Edition p 3

[Article by V. Ovcharov, SOVETSKAYA ROSSIYA correspondent: "Old Age Makes Equals"; relevant letters]

[Text] War and labor veterans everywhere have been perhaps the most attentive and fault-finding readers of the draft of the new Law on Pension Security. The Yoshkar-Ola City Council of Veterans adopted a resolution: to systematize all proposals and amendments, and through its national deputy T. Gorinov—incidentally, chairman of the Council of Veterans of the autonomous republic—to take them to the parliament of the country.

In room No 203 of the House of Political Enlightenment where, expressed in military terms, the veteran headquarters of the republic was quartered, a talk-discussion was held. The selection of the material received proceeded rapidly and emotionally. Time and again the

ideas of those gathered returned to the disputable points of the Law, crystallizing its main premises.

"On the whole the draft deserves approval. It must be finalized and brought into good condition," says V. Belousov. "Therefore, I do not want my comments to be thrown overboard. First. Article 75 speaks about the procedure for determining the average monthly wage, on the basis of which the pension is calculated. What is the principle? It takes five years running, and they are divided into 60. What does this lead to with respect to participants in the war? Injustice. There is a decree which gives war veterans as a benefit the right to take leave without salary for a period of two weeks. Many have already made use of this benefit. So now, with the conversion of the pensions, they all seem to be being punished for the benefit granted them. I think that an addendum should be incorporated into article 75, stipulating the substitution of the months not fully worked by veterans with full ones—according to the wages."

"A correct comment," K. Loskutov, former military pilot, gave his support. "The draft seems to have somewhat forgotten about us, the veterans. The overly large gap between the minimum and maximum pensions is conspicuous. Look, 70 rubles 'at the bottom' and 414 rubles 'at the top.' This is a five- or six-fold difference! War veterans who retired on pension earlier particularly suffer here. The proposed increases in pensions for war pensioners do not satisfy us, because in reality they prove to be meager. Old age makes equals of us all. I had gained the impression that among those who worked out the draft of the Law there were not only war veterans, but people who know their true position in life. Look how it is all turning around! Right now I receive a privilege pension of 120 rubles. I have to work, because you cannot live on 120 rubles. Now, according to the draft of the Law, they will pay me, I calculated, 118 rubles. That is how you have thought of us, the front-line soldiers!

"Furthermore. Why do you limit us to a service work length of 45 years? What happens? With one hand they add to our service period during the war, and with the other—they shorten it. Must war and labor veterans pay for the entire work service, especially since there is little left for us. No more, of course, than the maximum pension. You realize that right now pilots, let us say, retiring on a pension, will receive 300-350 rubles, while I, who fought through a war, and taught them how to fly in my time, get only 118 rubles. Where is the fairness here?"

"What was not properly reflected in the draft?" comments V. Chernov. "In the period when many of us retired on pension, wages were completely different—low. Afterwards they increased several-fold. Our pensions remained the same as had been established from my former wages. Now the scaling will be made from the same wages? I do not think that is right."

Veteran A. Shamov reinforced this point of view with his arguments.

"More than 33 years have passed since the adoption of the Law on Pensions in 1956. During this time the average rates for workers and salaries for engineering-technical personnel and employees tripled. As a result, the average wage, according to the data of USSR Goskomstat, rose by a factor of 2.5. This means that the pension for most of today's veterans was designated from a very low wage. Meanwhile, they also worked during wartime, and after the war to rehabilitate the national economy, with tremendous stress. At the plant for commercial machine building, which was moved from Kiev during the war, I remember, we had teenagers working for us. They worked for 16 hours. It was the duty of the shift foreman to go in and wake up everyone who had fallen asleep at his work place. That is how they worked! This is in no way taken into consideration in the draft of the Law, though. Because of this I have a proposal: for those veterans whose pensions, in accordance with the 1956 law, were designated from a low wage, the addition for service life for each six months of work should be established not as one percent, as is proposed, but at two. This will provide them the minimum necessary for normal life."

"I will talk about the bifurcation in the size of the pensions," L. Kurmuzakov, chairman of the Yoshkar-Ola City Council of Veterans, enters the discussion. "It should be no more than one to three. Why take a pension up to 414 rubles? Old age, as someone already said here, makes us all equal. A pension limit of 240 rubles will permit the State to release about 10 billion rubles from the 29 billion required to pay pension security. They can be used for other social purposes, including additional payment to veterans who receive no pensions. This will be real social justice."

"What is the question?" N. Smyshlyayev, deputy chairman of the republic Council of War and Labor Veterans, summed up the exchange of opinions. "It is about everyone in the pensioner corps receiving a pension on which he could live no worse than others. The proposed Law is only a draft and, naturally, it could not take everything into consideration. Let us hope that our considerations concerning the final phase of work of the pension Law will be taken into account."

It is not a simple matter—creating a national law. How can one law take into consideration the interests of whole strata of society, how, avoiding unwarranted leveling, can one ensure, for each person, an old age worthy of his contribution to the general property? Is this possible? White-haired men, hoary with age, veterans of war and labor are convinced: it is possible! It is, if in the final adoption of the Law, everyone whom the people trusted to approve it will remember that they are voting for a Law that takes into consideration the opinion of the citizens.

I Submit a Proposal

Given the existence of a pension for old age and for invalids from childhood, working and receiving, regardless of their wage, a social pension (according to the draft

of the Law), leave the latter, i.e., the social pension, along with the old-age pension, calculated from the wage. Take into consideration, in the general length of work service, the time of disability for a personal work injury, if the break in work is one year and over, for everyone, without exception, in the professions (for persons in the first and second groups of disability)—K. Yermolina, labor veteran, Staraya Kupavna, Moscow Oblast.

I propose introducing changes in article 76. The earnings for calculating the pension include all types of wages, on which, according to the existing regulations, the payments for insurance are calculated, including payment for long-term combining of jobs (five years and over), except for payments for combining jobs for less than five years and all types of payment of a one-time nature, not resulting from the existing wage system (compensation for unused leave, gratuity on discharge, etc.), the list of which is approved according to the procedure determined by the USSR Council of Ministers—A. Lukin, World War II participant, Moscow.

I think it expedient to propose making a recomputation of the pensions of all pensioners who retired on pension before 1989, in consideration of the Law on Pension Security for Citizens of the USSR—D. Savina, Leningrad.

In speaking of the pension for years of service (articles 82, 83), there should be allotments for instructors at schools, PTU [vocational-technical schools], tekhnikums and VUZes, since the nature of their vocational work differs little from the work of artists. For teachers, unfortunately, the loss of their professional ability to work sets in early—T. Lyutova, Rostov-na-Donu.

The humanity of society is determined by its attitude toward children and old people. I would also add: "And toward women," particularly mothers with many children. I think that the following addendum should be incorporated in the draft of the law: "Women who have borne and raised five children and more, with the necessary length of service, should have their work pension increased by 50 percent"—D. Gaboyev, Ordzhonikidze, North Osetian ASSR.

CIVIL AVIATION

Cryogenic-Fueled Tu-155 Detailed

904H0099A Moscow GRAZHDANSKAYA AVIATSIYA in Russian No 12, Dec 89 pp 12-15

[Article by V. Andreyev, chief designer of the Tu-155 aircraft: "The Tu-155: A Prologue to the Future"]

[Text] The search for a replacement for hydrocarbon fuel is under way in many countries. There are two reasons that compelled scientists and engineers to turn their attention from the customary and assimilated fuels of kerosene and gasoline. First of all, the supplies of oil will come to an end sooner or later. Secondly, an entire "bouquet" of substances which contaminate the environment is released into the air when hydrocarbon fuel is burned.

Avation specialists' attention has been drawn to liquid hydrogen for a long time now. Its relatively high calorific value (three times more than for hydrocarbon fuel) and progress made in the area of chemical technology which promises that cheap liquid hydrogen will be obtained in sufficient quantities in the near future are cause for optimism. Moreover, it is ecologically clean as an aircraft fuel: only water is formed when hydrogen is oxidized. And there is no carbon monoxide, and no sulfur or phosphorus compounds! For the sake of this prospect, it is worth attempting to overcome specific problems. And it must be confessed that they are sizable ones. The increased explosion and fire hazard. In addition, the volatility, and the capacity to return to a gaseous state when there is the slightest deterioration in a system's airtightness. Hydrogen evaporates instantaneously, fills up all free space and forms an "explosive mixture" with the air. The tripping of relay contacts or the sparking of brushes in electric motors (and there is always an abundance of electromechanical and electronic devices on board) is enough to result in a catastrophe.

The most serious problem is using a cryogenic fuel system on board. Normal kerosene and gasoline do not require any heat insulation for the tanks and supply lines throughout the range of temperatures and pressures (even when they are reduced at maximum altitudes); they do not solidify and begin to boil. But liquid hydrogen, which has a boiling point of minus 253 degrees Celsius, requires highly effective, vacuum screen heat insulation, as a rule. But even with that, it is in a boiling condition, and a special system to maintain increased pressure is necessary; otherwise most of the fuel will boil away in the climb to altitude.

The third problem is the fuel volume. Hydrogen requires roughly four times as much volume as hydrocarbon fuel. The space in the wing torsion boxes which is "sufficient" for kerosene is not large enough for it.

Everything mentioned above does not give us the right to maintain that hydrogen is the fuel of today. But it also seems to me that it is not far from being the fuel of the day after tomorrow! Moreover, the firstborn of cryogenic aviation, the Tu-155 aircraft, has already taken off. Its first flight, which lasted just 21 minutes, took place on 15 April 1988, that is, over 6 months ago. And the practical experience accumulated over this period makes it possible to draw certain conclusions.

It must be stated first of all that the Tu-155 is a special experimental aircraft, and there is only one. It is doubtful that even one passenger will ever climb its ramp. The mission of the Tu-155 is to help decide whether or not there will be a hydrogen-powered aircraft. Because only a flight can bring to light all aspects of the problems of developing a new aircraft.

The collective of the OKB [Experimental Design Bureau] imeni A. N. Tupolev resolved numerous aviation equipment design problems by building experimental aircraft in the past as well. And now this tradition has been continued. Work on the Tu-155 project was begun several years ago. Considerable time was taken to perfect individual systems on test stands. Electrically driven centrifugal pumps were tested in special cryostats. Considerable testing was done with cutoff fittings, fuel measurement equipment, and other systems.

Thorough testing of the systems on the stands made it possible to proceed to experiments (first on the ground, then in flight) with the actual on-board systems. A Tu-154B, which has a large passenger cabin, was chosen as the basic aircraft. A fuel tank was installed in the tail section. The design bureau headed by N. Kuznetsov developed the NK-88 hydrogen engine for our aircraft. It was installed in the right engine nacelle. The fuel system operating on kerosene was left as a reserve in parallel with the hydrogen fuel system.

The concept of ensuring that the aircraft is explosion-proof and fireproof was based on new methods covering all stages of the experiment, beginning with the planning of ground facilities and ending with flight tests of the aircraft. While previously the basic task of ensuring safety in the "kerosene" aircraft was perceived as preventing explosion in the fuel tanks, the main objective now is to prevent contact between the hydrogen and the air in any part of the aircraft except the engine's injectors. But this means removing the residual air from the fuel system before the first fueling and preventing its depressurization even when components fail. The second procedure for reducing the risk of explosion or fire to a minimum is to remove the possible sources for ignition of a hydrogen-air mixture.

The experimental fuel complex consists of a fuel tank, units for controlling the fuel supply, and fuel lines. It is installed in a pressurized compartment. The assemblies and pipelines of the engine containing hydrogen are encased in a container installed in the upper part of the nacelle. The pipelines for flight and emergency venting are fed to a venting device installed on the vertical

stabilizer (over the tailplane), but the fuel jettison pipe is fed to the nozzle cutoff of the center (regular) engine outside the fuselage.

All the regular systems of the aircraft are outside the compartment for the experimental fuel complex. The electrical, hydraulic, and other lines outside the compartment are purged with atmosphere air in flight. Elements of the experimental system which do not contain hydrogen are located in the aircraft cabin, the forward baggage compartment, and the tail technical compartment.

The compartment for the experimental fuel complex is separated from the fuselage by special zones: double bulkheads, between which excess pressure is generated, are installed in the vicinity of the 46th and 67th frames. For this reason, even in the event of a hydrogen leak it will not penetrate the adjacent compartments. The container for the engine's hydrogen units is made of stainless steel and is thoroughly sealed (just as the lead-ins for the piping and electric harness are) with a special sealant. Spark-resistant electrical equipment is installed in the fuel compartment and the engine nacelle; the electrical circuits are also spark-resistant because they are specially shielded.

There are systems for warning, detecting, and suppressing situations associated with hydrogen leaks in the structure of the Tu-155. Detection is provided by a gas monitoring system which gives a warning if gaseous hydrogen appears in the fuel compartment, the engine nacelle, the container for the equipment, the cockpit, the cabin, or the baggage compartment. In addition, systems have been provided for fire warning, smoke detection, and monitoring the vacuum in the insulation of the fuel tank and the pipelines. The following systems were designed to prevent and suppress dangerous situations: the system for ventilating the nacelle and the equipment container with atmosphere air; the system for ventilating the fuel compartment with air from the on-board air conditioning system; the system for pressurization with nitrogen, replacing the air in the fuel tank, nacelle, and equipment container with a neutral nitrogen medium; a fire extinguishing system; and a system for pressurizing the zones separating the fuel compartment.

The use of cryogenic fuel has made it necessary to fundamentally change practically the entire power plant of the aircraft. A two-stage centrifugal pump was installed to ensure that the hydrogen is fed to the engine under a pressure of up to 40 kilograms-force per square centimeter. It is set in motion from a turbine which operates on air (taken from the engine compressor). In connection with the fact that it is extremely complicated to ensure stability in the processes of adjustment and combustion in feeding the fuel to the combustion chamber (in view of the virtual impossibility of avoiding evaporation in the lines), the liquid hydrogen is gasified before it is fed to the injectors and heated up to a temperature of minus 170 degrees in a heat exchanger. The fuel is fed to the engine by three electrically-driven centrifugal booster pumps with a capacity of 1,100 kilograms per hour at a pressure of 1.5 kilograms-force per square centimeter.

In order to ensure that the pumps operate without cavitation and interruption of pressure, they are installed in a specially separated airtight fuel compartment. The liquid hydrogen is fed to this compartment from the basic fuel tank by jet pumps actuated by the fuel taken from the high-pressure line for the centrifugal pumps. The discharge of the jet pump is somewhat higher than the loss of hydrogen from the delivery compartment, and for this reason the delivery compartment is always full and has somewhat higher pressure than the basic compartment. A cavitation supply for the booster pumps is developed in this manner. In addition, the continuous consumption of liquid hydrogen through the centrifugal booster pump for driving the jet pump does not permit it to be overheated and gasified in the centrifugal pump even when the engine is inoperative.

The fuel tank and the engine feed line with the units arranged on it have the vacuum insulation universally adopted in cryogenic technology. In order to reduce the likelihood of hydrogen leaks, the feed line has two valves, one of which is located inside the tank, and the other in front of the engine. The valve inside the tank makes it possible to cut off the external cryogenic lines when necessary. The drive for these valves (as well as the other cryogenic valves) is provided by gaseous helium under high pressure, since other gases turn into a solid state at this temperature.

When the engine is not in operation, helium is fed into the line between the valves at a pressure somewhat higher than that in the tank. The presence of a helium "lock" prevents the liquid hydrogen's thermal contact with the air and its condensation. In the event of valve leakage, helium gets into the engine feed system and the aircraft compartment, not hydrogen. The hydrogen line from the turbopump assembly to the engine intake has polyurethane foam heat insulation.

Since the hydrogen is kept in the tank in a boiling state, it is advisable to maintain pressure in it which is equal to the pressure of saturated vapor throughout a flight. For this reason, the aircraft has a system to maintain pressure, consisting of subsystems for pressurizing with gaseous hydrogen and regulating the release of hydrogen, an emergency-safety device, and for emergency pressurization of the tank with helium. Pressure is maintained at the level of 1.3 to 1.5 kilograms-force per square centimeter by the ejection of hydrogen from a gaseous area into the venting line.

The venting line has heat insulation and a pressure regulator with three valves. Two valves are positioned in parallel, and one in sequence with the first two. This arrangement ensures sufficient reliability for the system. The valves are controlled by gaseous helium under high pressure in accordance with a signal from warning indicators on pressure in the tank. The hydrogen is ejected

through a safety venting device; it is based on the principle that the speed of the hydrogen's release will exceed the speed at which flames are spread. In order to ensure safety under transitional operating conditions, helium is fed into the venting line.

The emergency-safety device consists of safety valves arranged in parallel adjusted for different pressure. When the heat insulation of the fuel tank is broken, the safety valves are actuated and the hydrogen is ejected by a heat-insulated line to the upper part of the aircraft's vertical stabilizer. The emergency pressurization subsystem is intended to pressurize the tank with helium in the event that the hydrogen pressurization system fails or to jettison fuel in an emergency. Fuel is jettisoned through the fuel line (after the tank is filled, a pipeline ending in the aircraft's tail section is connected to it).

All fuel lines, aside from the points where they are connected to the engine, are sealed with airtight welding. The pipelines for the engine and the system to maintain pressure have detachable connections.

We managed to accommodate enough fuel on the experimental Tu-155 to conduct test flights lasting for an hour to an hour and a half. The fuel tank is structurally simple; there are actually two tanks, one installed within the other. The inside tank is mounted at six points with the help of an attachment system. This solution makes it possible to evaluate the condition of the inner tank and its attachment system and to develop and check a large number of systems which support the functioning of the inner tank and provide for protection against explosion and fire.

A fueling complex, located on an isolated pad for work safety reasons, has been set up to fuel the aircraft with liquid hydrogen; it is also used for parking and technical maintenance of the aircraft. The liquid hydrogen is brought to the pad by fuel trucks. They are connected up to the aircraft through fixed cryogenic pipelines with a safety cutoff fitting. This fitting ensures that the necessary fire-prevention gaps exist between the aircraft, the fuel trucks, and the point where the gaseous hydrogen being vented is ejected into the atmosphere. Up to four fuel trucks can be connected up to the fixed pipeline system at the same time.

The liquid hydrogen is drawn from the fuel truck when excess pressure is created in its tank. A built-in liquid hydrogen gasifier, which uses the heat from atmosphere air, provides for this. The safety cutoff fitting is controlled remotely during the fueling, from a control point, and the fueling parameters are adjusted semiautomatically.

In order to ensure the safety of operations and reduce the accumulation of gases in the tank which change into a solid state at the temperature of the liquid hydrogen, a maintenance regulation provides for a thorough purification before refueling and periodic warming of the systems up to the temperature of volatilization of the additives for monitoring by the method of gas chromatography. The gaseous hydrogen necessary for preliminary purification and warming is taken from the space above the fuel in the fuel truck and is warmed to a favorable temperature. A filter with filtration rated at 5 microns of fineness is installed at the end of the fueling line. The fueling pad has been equipped with fixed facilities to spray the aircraft, the fuel trucks, and the ground complex with water.

The first test flight of the Tu-155 was followed by others. Various situations were checked out: maneuvering, starting the engine in flight, and certain malfunctions. The longest time the aircraft has been airborne is already over an hour. Two methods of ensuring safety from fire and explosion were tested. First the entire compartment for the hydrogen fuel system was filled with nitrogen. Then forced ventilation was tried, or more accurately, purging the compartment with air taken from the engine. Both methods proved to be effective.

Among the malfunctions "played through" in the tests was the failure of the fuel system valves, including the most dangerous situation—a descent when the valves are not closed. The automatic operation of the emergency valve, which regulates the pressure of liquid hydrogen in the fuel system, was also checked. All of these nonroutine situations were simulated on the ground as well as in flight. We simulated emergencyjettisoning of fuel only on the ground, using liquid nitrogen instead of fuel. This operation was performed on the ground, but not in flight, owing to the fact that the pipeline opening is brought out near the nozzle of the number three engine and the fuel ejected is "washed away" intensively by its jet blast.

What are the conclusions drawn as a result of the tests? The most important and unequivocal one is that flight with liquid hydrogen is possible not only theoretically, but practically as well. The problems in accommodating a cryogenic fuel system on board are surmountable, and reliable protection may be found to cope with the increased danger of explosion and fire. Design solutions were outlined which make it possible to move to the development of a series aircraft later on. During the course of the work an experimental base was established for testing, we became familiar with the equipment and methods of the experiments, and we acquired practical experience in utilizing an unusual form of fuel. Finally, cooperation was developed among the scientific and production collectives engaged in aircraft cryogenic systems.

However, with all the promise of liquid hydrogen as an aviation fuel, there are a number of considerations which must be taken into account. The use of hydrogen substantially improves the performance of an aircraft (the load capacity and range) because its calorific value is three times that of aviation kerosene. So a supersonic passenger aircraft operating on liquid hydrogen would be twice as light as the Tu-144 or the Concorde. However, the volume of the new fuel turns out to be four times as great! Providing for such a significant increase in fuel

tanks is extremely difficult on a light aircraft; for that reason, hydrogen is obviously more suitable for heavy aircraft.

And more. Liquid hydrogen is very expensive at present. Compare: a ton of kerosene, as planned, will cost 65 rubles, but a ton of hydrogen will cost all of 6,000 rubles! Even if it is reduced to a conditional equivalent, taking into account that hydrogen has three times the calorific value, there is still a difference—more than a tenfold one. So there is an obstacle on the path toward practical introduction of hydrogen fuel for aircraft, and it can be eliminated only by making the technology for producing hydrogen much less expensive. Nevertheless, the increased interest shown by foreign firms in our experiments attests to the fact that this is a practical prospect.

But aside from hydrogen, there are other fish in the sea today, as they say. There is one more type of promising fuel for which a fuel system may be adapted by our collective in the very near future. This is liquefied natural gas. In a short period of time we reequipped the experimental Tu-155 aircraft to operate on liquefied gas. Strictly speaking, the modification basically came down to the installation of an additional booster pump. Liquefied gas will be twice as inexpensive as aviation kerosene: the cost of a ton, as planned, is 94 rubles. It can be obtained from any gas source in our country with minimal energy inputs: after purification to rid it of water and foreign matter, a gas distributing station (and we have enough of them) can provide 5 percent of the gas in liquefied form. And the energy for liquefaction will be acquired only by a drop in pressures. This amount—5 percent of the gas produced in the country—would be more than enough to meet all the needs of civil aviation. Moreover, a developed network of stations producing gas fuel for motor vehicles (in cylinders under 200 atmospheres of pressure) could turn it out in liquefied form as well.

In short, liquefied natural gas can be extensively used as an aviation fuel even today. Moreover, there has been experience in adapting compressed gas in motor vehicles. True, liquefied gas does not promise a substantial increase in aircraft performance. At present it is roughly equal to the performance of aircraft operating on kerosene, but with further refinement of designs it will be improved, but not by much. But after all, the low price and availability speak on its behalf. And although it is unquestionably inferior to hydrogen in its ecological indicators, it is still considerably superior to hydrocarbon fuel.

All these considerations were fully confirmed with the Tu-155 flights. Results of the experiments turned out to be so reassuring that the decision was made to develop the Tu-156 aircraft, which uses liquefied natural gas as its basic fuel. In principle, it will be adaptable to operate on kerosene as well, inasmuch as a certain amount of time will be required to reequip the fueling services at airports everywhere. The Tu-156 flight tests are tentatively scheduled to begin in mid-1992.

The NK-89 engine has already been developed for the new aircraft. While the NK-88 is adaptable for operation on liquid hydrogen or liquefied natural gas but cannot operate on aviation kerosene, the NK-89 can combine these two types of fuel. The difference here is in the design: different injectors and turbopump assemblies, and a heat exchanger, in which gasification of the fuel takes place.

The Tu-156 was also conceived as a modification of the Tu-154B. Three NK-89 engines have been provided for it. Two streamlined tanks (11.9 meters long and 1.9 meters in diameter) positioned under the wing hold about 14 tons of liquefied gas. The wing torsion boxes hold 3.67 tons of kerosene. The en route fuel reserve (as well as the kerosene) is 6.6 tons. The takeoff mass of the aircraft (according to calculations) will be equal to 98 tons with a payload mass of 16 tons. Its operational range should be 2,180 kilometers.

Hydrocarbon fuel, which has held sway completely in aviation and, it must be admitted, has provided mankind with good service, is making ready to pass the baton to more economical and ecological forms of fuel. The experimental Tu-155 aircraft has turned out to be on the front line in the progress of aeronautical science and technology. We can confidently call it the reconnaissance aircraft of the near future.

Aircraft Commander Status Documentation Drafted

Editorial Staff Introduction

904H0081A Moscow VOZDUSHNYY TRANSPORT in Russian 2 Dec 89 pp 1-2

[Draft of document defining status of the aircraft commander, with introductory remarks by VOZDUSHNYY TRANSPORT editorial staff: "Status of the Aircraft Commander"]

[Text] Definition of the aircraft commander's status, that is, his legal standing, is a practical objective.

The legal standing of the KVS [aircraft commander] currently is defined in a large number of different normative documents, which include a great many unjustified restrictions and regulation in every possible kind of instruction and directive; they are often contradictory and lack legal protection for the aircraft commander.

Drafting the status of the KVS is the first experiment in drawing up such a document in the USSR. In the ICAO [International Civil Aviation Organization], the question of the aircraft commander's status has been part of the Legal Committee's program since 1947. A decision by the committee in 1980 states: "Leave the question of the aircraft commander's legal status as an important

point in the overall program of the Legal Committee's work (Doc. 9314 A 23-1E)."

Our suggestions in drafting the aircraft commander's status are as follows:

1. The aircraft commander is an employee; hence, his main functions are those of a pilot.

2. He performs a number of specific functions on an aircraft: he is in charge of the crew, he sees that there is discipline and order on the aircraft and that flight and aircraft operating rules are adhered to, and he takes the steps necessary to ensure the safety of persons on board and the security of the aircraft and property.

3. Authority in relationships with different organs and officials which have been made responsible for servicing the aircraft and the crew in carrying out assignments in flight.

4. It is necessary to legally consolidate basic guarantees to realize the aircraft commander's rights, including his labor rights.

The question of the aircraft commander's status should hold an important place in the system of normative documents. Our suggestion: specify that the aircraft commander's status is confirmed by the USSR Council of Ministers or in a procedure established by the USSR Council of Ministers.

It will be necessary to bring all the normative documents of the Ministry of Civil Aviation into conformity with confirmation of the aircraft commander's status. In particular, the specific responsibilities of organs and officials should conform exactly to the rights of the aircraft commander.

In publishing the first version of the draft status of the aircraft commander, we invite cockpit personnel and all civil aviation employees to express their opinion and to offer suggestions for improving the draft.

Please send remarks and suggestions to the GlavULS MGA [Flight Service Main Administration of the Ministry of Civil Aviation] and the Civil Aviation Academy.

From the Editorial Staff: In our time it is customary to discuss all of life's major questions openly in the press, on radio and television, and in meetings of labor collectives. This form of discussion is not only of political significance, but of great practical importance as well. After all, even one comment or suggestion that has been heard or read by many people can determine the direction of further discussion and bring forth a considerable number of valuable ideas and wishes. Only in such a situation can the draft under discussion really become the fruit of collective reason and make it possible to avoid inaccuracies. The question of the aircraft commander's status is unquestionably one of vital importance to employees in the sector. We suggest that our readers discuss this question in the pages of the newspaper as well.

Draft of Status Document

904H0081B Moscow VOZDUSHNYY TRANSPORT in Russian 2 Dec 89 pp 1-2

[Text] In conformity with the Aviation Code of the USSR, the crew of a civil aircraft of the USSR consists of the commander, other members of the cockpit crew, and attendants.

The composition of the crew of a civil aircraft is determined by the USSR Ministry of Civil Aviation and depends on the type, class, and purpose of the aircraft, as well as the objectives and conditions of its operation.

A civil aircraft is not authorized to fly without a full crew. The cockpit crew and attendants must have special training in conformity with their position (specialty) and be familiar with the Aviation Code of the USSR, as well as the rules, manuals, handbooks, and other documents which regulate their work. They must be responsible for their state of health as established by requirements.

Only citizens of the USSR can be crew members of civil aircraft.

Exceptions to this rule may be made in the procedure established by the USSR Council of Ministers.

1. General Provisions

1.1. The aircraft commander has the specialty of pilot (airman), as well as the training and expwerience necessary for independent control of a given type of aircraft, and is the person responsible for controlling the aircraft and for its safety in flight.

1.2. The aircraft commander is immediately subordinate to the commander of his subunit.

1.3. In carrying out a flight assignment, the aircraft commander is the person empowered to act on behalf of the aviation enterprise (association) to which the aircraft legally belongs for day-to-day operation or which owns it.

1.4. The authority of the aircraft commander is regulated by the Aviation Code of the USSR and the present document, as well as normative documents of the USSR Ministry of Civil Aviation which have been issued on their basis.

1.5. All directives related to the operation of an aircraft are addressed only to the aircraft commander, who bears the responsibility for their implementation.

1.6. The aircraft commander has the sole right during a flight to take charge of the aircraft and make the final decisions.

1.7. The presence on the aircraft of higher officials (check pilots) does not absolve the aircraft commander of any of his responsibilities.

1.8. Within the limits of his competence, the aircraft commander issues instructions, which must be carried out without question, to any person on the aircraft.

1.9. The aircraft commander ensures that a routine of work and rest is provided for crew members in conformity with labor legislation and the Decree on Work Time and Relaxation for Civil Aviation Employees which is in force.

1.10. Relationships betweeen consuls of the USSR in other countries and the aircraft commander and other crew members are regulated by the Consular Regulations of the USSR.

2. Functions of the Aircraft Commander

2.1. The aircraft commander:

—pilots the aircraft;

—supervises all activity by the crew;

—ensures that there is strict discipline and order on the aircraft;

—adheres to flight and aircraft operating rules;

—takes the steps necessary to ensure the safety of persons on board and the security of the aircraft and property; and

—arranges transactions on behalf of the aviation enterprise to which the aircraft belongs.

2.2. The aircraft commander bears the responsibility for flight safety, regardless whether he is flying the aircraft or he has passed control to the copilot.

2.3. The aircraft commander organizes crew members' work on the ground and in flight in conformity with the requirements of normative documents, and he monitors implementation of the functions assigned to crew members as well.

2.4. The aircraft commander monitors the maintenance of discipline and order on the aircraft in conformity with the laws in effect and takes steps to ensure their implementation.

2.5. The aircraft commander pilots and operates the aircraft in conformity with the normative documents in effect.

2.6. The aircraft commander has been given the authority to take the steps necessary to ensure the safety of persons on board and the security of the aircraft and property.

When necessary, the commander of an aircraft in flight conducts an inspection of hand-carried baggage and baggage and a personal examination of passengers, regardless of their consent. The rules for conducting an inspection and the list of persons who have the right to inspect are established by the USSR Council of Ministers.

2.7. The aircraft commander takes the steps necessary to prevent and stop acts of illegal interference in civil aviation activity. These steps are taken in conformity with the laws and rules in effect in the territory of the USSR.

2.8. The aircraft commander conducts transactions, without special powers, on behalf of the aviation enterprise to which the aircraft belongs, involving the ferrying of an aircraft and the transportation of baggage, cargo, and mail, and he takes other steps as circumstances warrant.

3. The Aircraft Commander's Rights and Responsibilities

3.1 The aircraft commander's rights:

3.1.1. The commander of an aircraft in flight possesses plenary powers which are defined by law.

3.1.1.1. The aircraft commander's right of undivided authority on the aircraft begins with the start of preflight preparation and ends with the completion of the crew's postflight work.

The aircraft commander's decisions are binding on all persons involved with preparing and loading a given aircraft for flight in the area which concerns them.

3.1.1.2. Within the limits of his competence, the aircraft commander has the right to give instructions, which must be carried out without question, to any person on board.

3.1.1.3. [The aircraft commander has the right] to take all the steps necessary against persons who threaten flight safety by their actions and do not obey his orders.

3.1.1.4. Upon the aircraft's arrival at an intermediate airport, the aircraft commander has the right to remove such persons from the aircraft, and if acts committed by them have the signs of a crime, to turn them over to the appropriate authorities.

3.1.2. The aircraft commander, without special powers, has the right to conclude contracts (agreements) on behalf of the aviation enterprise (association) to which the aircraft belongs in the interests of the passengers and shippers, and to provide for the security of the aircraft and the property it carries, as well as to take other steps as dictated by the circumstances.

3.1.3. The aircraft commander makes the final decision on the departure, flight, and landing of the aircraft, as well as the discontinuation of a flight and return to the point of departure or a forced landing.

3.1.4. In the event of a clear threat to flight safety, the aircraft commander may make the decision to deviate from the flight plan, air traffic control instructions, and the flight mission. The aircraft commander informs the air traffic control facility controlling the aircraft without delay of the actions undertaken.

3.1.5. Flight services are obliged to accommodate the aircraft and its crew in conformity with established rules and in the periods specified, and to carry out the instructions and meet the requirements of the aircraft commander related to services provided for the aircraft and crew. The enterprise performing the service bears the responsibility established by law for failure to provide service for the aircraft, for service of poor quality, or for being late in meeting its obligations.

3.2. The aircraft commander's responsibilities:

3.2.1. In carrying out a flight assignment, the aircraft commander is obliged to adhere precisely to the requirements of the Aviation Code of the USSR and other normative documents issued on its basis.

3.2.2. If an aircraft in flight is in danger or distress, the aircraft commander is obliged to take all possible steps to protect the lives and well-being of persons, as well the aircraft and the property it carries. The commander is the last one to leave the aircraft.

3.2.3. The commander of an aircraft which has received a distress signal from another aircraft or an ocean-going ship, or a vessel sailing in inland waters, or a vessel discovered to be in or to have been in distress, or persons who are in danger, is obligated to render assistance, inasmuch he can do this without danger to the aircraft, passengers and crew in his care, to locate the position of the distress on a chart and report it to an air traffic control facility.

3.2.4. The aircraft commander bears responsibility for controlling the aircraft in conformity with established rules, regardless if he or the copilot is flying the aircraft, except in cases when he may deviate from these rules (See 3.1.4.).

4. The Aircraft Commander's License (Certificate) and Skill Ratings

4.1. Persons who do not have a valid license (certificate) which corresponds to the duties entailed are not authorized to perform the functions of an aircraft commander.

4.2. The organ with full authority to issue licenses (certificates) to personnel is the Ministry of Civil Aviation, including the department issuing the licenses (VKK, MKK [expansions unknown])—the subunit responsible for issuing licenses and the skill ratings in them.

4.3. After it has issued the license, the organ with authority guarantees that its holder will have the rights stipulated by the license (certificate) in conformity with the requirements of Paragraph 1.4.

4.5. [Paragraph 4.4. is omitted without explanation] The procedure for issuing licenses (certificates) is specified by the Decree on Awarding a Skill Rating and Issuing Licenses to Civil Aviation Specialists.

4.6. Verification that the aircraft commander's skill conforms to the requirements for him to exercise the rights stipulated by the license (certificate) is provided by the individuals authorized (check pilots).

4.7. Relationships between the aircraft commander and the check pilot in preparing for and taking part in a flight are regulated by special documents of the Ministry of Civil Aviation in strict compliance with the Aviation Code of the USSR and this Status.

5. Regulating the Aircraft Commander's Work

5.1. The labor relationships of the aircraft commander are defined by the labor contract concluded between the aircraft commander and the aviation enterprise (organization) for which the aircraft commander is obligated to perform work in a definite specialty and skill with adherence to internal labor regulations; the enterprise (organization) is obliged to pay the aircraft commander the salary and provide the work conditions stipulated by the labor legislation, the collective contract, and the agreement of the sides.

5.2. The aircraft commander's labor is regulated by the laws of the USSR and union republics on labor and documents of the labor legislation of the USSR, the KZoT [Labor Codes], and other labor legislation documents of the union republics.

5.3. Features of the legal regulation of aircraft commanders' labor are permitted in the cases stipulated directly in the labor laws of the USSR and union republics.

5.4. Conditions of a labor contract which worsen the standing of aircraft commanders in comparison with the labor legislation of the USSR and union republics are invalid.

5.5. The aircraft commander bears disciplinary, administrative, andeconomic responsibility, and criminal responsibility in the appropriate cases, for violating the legal norms which regulate his work.

5.6. Making the aircraft commander responsible for damage which can be categorized as normal economic-production risk cannot be tolerated.

All-Weather Aircraft Needed for Polar Regions

904H0084A Moscow SOVETSKAYA ROSSIYA in Russian 15 Dec 89 First Edition p 1

[Report by V. Ivanov: "The Arctic Without Wings: Northern Residents Are Waiting for New Aircraft"]

[Text] Dikson, Krasnoyarsk Kray—It is 750 kilometers from the settlement of Dikson to the island of Srednyy. By an Arctic yardstick, it is close by. For the Mi-8 helicopter, it is a little over 4 flying hours, But this is in theory, the TASS correspondent thinks. And in practice?

"We will be in the air for 7 or 8 hours," says V. Kharin, commander of the Dikson Aviation Enterprise. "We do not always have to fly by the shortest route in the Arctic. But it is not changes in the weather that force us to change course. A regulation from the USSR Ministry of Civil Aviation prohibits flights by the 'eights' [Mi-8's] over the sea for safety reasons. If there is a forced landing, the aircraft will go to the bottom in an instant. And there have been such cases in the history of Dikson's squadron. So more often we have to transport empty passenger seats, a minimum of cargo, and additional fuel tanks. Meanwhile, persons are forced to stay in Dikson for weeks, waiting for an opportunity to get to their place of work on remote islands forsaken in the icy waters of the Arctic Ocean."

But after all, just a few years ago pilots regularly took polar residents in Li-2 aircraft from Dikson to Cape Chelyuskin, the island of Srednyy, and Franz-Josef Land. But the North was deprived of these aircraft in the 1970's. The last Il-14 was written off in August this year. Veterans of the Arctic literally wept when they saw it off on the last flight. The time is up for these aircraft. They are technically obsolete, and alas, no replacement is being found for them. And this is the result: there are practically no passenger flights in the Arctic now.

Not only passengers, but cargo as well, cannot be transported regularly here because of the lack of modern all-weather airplanes and helicopters. The aviators have to build additional fueling stations along the shore, maintain personnel for servicing, and pay the seamen for delivering fuel to the ice piers. As a result, the cost of flights has increased and extra fuel is being burned. But can it really be extra in the North? The main point is that every helicopter now carries only 500 kilograms instead of 1.5 to 2 tons of cargo. So in the opinion of the manager of the Dikson headquarters for maritime operations, V. Cherenkov, the Arctic is left without wings; the old small aircraft have been written off and there is no suitable replacement for them.

True, series production of the An-74 was begun recently, but this aircraft is not yet capable of competing with its predecessors. The northern residents are being promised two more powerful Mi-8MT helicopters in 1990. But they still must undergo testing at the Scientific Research Institute of Civil Aviation. So is the situation hopeless?

"We have been corresponding for several years with the Ministry of Civil Aviation and the Ministry of the Aviation Industry about the Arctic's need for helicopters with greater capacity, longer range, and more powerful engines," V. Kharin explains, touching a pile of letters. "But the main point is that the aircraft should 'be able to swim.' We get the same answer from Moscow to all our letters: designers of the bureau have been given the assignment of developing such equipment. But people in Dikson are well aware of the Mi-14 helicopter, which has been operated successfully for several years by military pilots. This aircraft resembles the Mi-8 outwardly, but the 'fourteen' has the distinction of being able to land on the water."

A great deal has been said about conversion lately. About the fact that the plants turning our ultramodern aircraft will be making cribs, baby carriages, and meat grinders. This is commendable. But after all, Aeroflot is in distress without modern aircraft, especially small aircraft in the North. So is it right to utilize the vast intellectual and industrial potential of the sector only to expand the output of consumer goods?

The situation is further complicated by the fact that this region has had a single boss for a long period of time—the Northern Sea Route Main Administration. A strong subunit—the Polar Administration of Civil Aviation—was part of it. This was a very strong service with its material and technical base, extensive network of airfields, warehouses, design bureaus, and plants. In 1970 "polar aviation," as well as the Glavsevmorput [Northern Sea Route Main Administration], were abolished. Now the interests of numerous ministries and departments have clashed here. And not one of them is really concerned about the ecology, the economy, and the social and cultural development of the North. Everyone feels temporary here. And this cannot help but have an effect on aviation in the North.

RAIL SYSTEMS

USSR-US Rail Agreement Proposed by American

904H0131A Moscow GUDOK in Russian 3 Feb 90 p 1

[Article by Ye. Khrakovskiy: "USSR-United States: Common Problems To Solve Together"]

[Text] "Our railroads operate under approximately identical climatic conditions—perhaps for us the low-temperature period is shorter. Both in the USSR and in the United States the 'steel mainlines' perform a very large volume of transport. This means that there are many common problems which it is expedient to solve through joint efforts. Both our railroads and yours have achieved good results, but even the best business can and must be improved. It is best to do this jointly, by using the wealth of experience that has been accumulated in both countries."

This thought was expressed by Mr. Gerald Greenstein—president and chairman of the Board of Directors of one of the major railroad companies in the United States, Burlington Northern Inc.—in a conversation with me. He headed a delegation of American specialists who came to the USSR on invitation of N.S. Konarev, minister of Railways.

A characteristic detail: the delegation flew to see us on a company airplane. When I asked the president if it did not cost them a pretty penny to maintain their own "Boeing," he answered:

"It makes it possible to save time, which is very important for us, and, besides, it is simply convenient." He added: "This, by the way, is one of the reasons why our railroads do not have a large passenger transport volume.

People prefer airliners and motor vehicles, since our highways are good, to trains."

Capitalists do not feel it burdensome to maintain airplanes. How many needless talks have we had on the fact that the railroads and the Ministry of Railways maintain service coaches "for the bosses." This is with our vast uninhabited expanses, without roads, when at a small station there is nowhere to stay the night.... Pinching and scraping has never yielded good dividends.

Burlington Northern Inc. is linked by its assets to many industrial, transport and commercial firms, located in the region it serves in the northwestern United States and western Canada. The Americans are interested in improving the transport of grain and other freight from the United States to the USSR. The most convenient route is probably from the Pacific Ocean ports of the United States to our Far Eastern ports and then on along BAM and the Transsiberian to Europe.

This is why a decision has been made to study the problem of creating a profitable joint Soviet-American venture, which would study not only the creation of a reliable new transport bridge between the two countries, but also the industrial development of the Baykal-Amur mainline zone, including the development of timber, aluminum and trade in scrap, with the intention of increasing transport along BAM. There are plans to acquire special rolling stock to transport grain and coal, as well as double-tier flatcars to deliver containers.

Experts have been commissioned, before 1 May of this year, to work out all the problems and prepare specific proposals so that the agreements can be signed in a short time.

When talking with Mr. Greenstein, I told him that our newspaper had recently published material on the fact that as far back as the beginning of the century, American entrepreneurs had suggested continuing the rails from the Transsiberian to Chukotka, so that cargo could be ferried across the Bering Straits to Alaska and even across Canada to other U.S. states. I asked him: "What do you think, is it worth going back to this project?"

"I think, that with the development of economic ties between our countries (and this is in progress), more convenient, reliable communications are needed. The need may arise to construct this type of intercontinental railroad. This is, of course, not a matter of the next few years. It will probably be carried out in the 21st century."

The protocol of the negotiations, signed by V.N. Butko, deputy minister of Railways, and D. Greenstein, president of Burlington Northern Inc., outlined a broad range of cooperation. This includes introducing modern methods of managing the transport process, seeking ways to increase locomotive use efficiency, and to improve their structure, including the use of natural gas as a fuel, using efficient means of diagnosing the state of the rolling stock, and many, many other things.

For example, the company is making wide use of the KOMPAS information-control system on its roads. The operators at the sites feed the necessary information into the system's data banks, and the managers can at any time receive the necessary information on their color display screens. Systems like this are being developed and the principles are being applied on our railroads as well. Mutual exchange of experience will be very useful.

"You in the USSR have created good software for transport process control, and have many highly qualified programmers. We, in the United States, have excellent electronic computers. We should certainly not let slip conditions so favorable for fruitful cooperation," G. Greenstein emphasized.

Right now great importance is being attributed to developing automated systems to track rolling stock—locomotives, cars and containers—by means of computer equipment and satellite communications. Here too there is a broad field for the close cooperation and joint research of Soviet and American specialists.

Both the American and the Soviet railroads have had many achievements in operating heavy trains (incidentally, the average gross weight of a train on the roads of the Burlington Northern Inc. is almost 5300 tons), and in increasing axle loads. A broad exchange of experience would undoubtedly be useful.

The close cooperation of scientific-research and design organizations can yield fruitful results.

Thus, the first steps have been taken to meet each other halfway. The American specialists who came to Moscow, Krasnoye Limano and Leningrad, and who visited a number of our transport enterprises, learned a great deal.

"Everything that we have seen," noted G. Greenstein, "has made a great impression on us. The friendly atmosphere at the meetings and talks, which to a considerable extent contributed to the success of our negotiations, has won our hearts."

It can only be hoped that in the future the cooperation of the Soviet and American railroad workers becomes even stronger and bears tangible fruit.

Rail Ministry Studies Space Technology Applications, Satellite Communications

904H0139A Moscow GUDOK in Russian
1 Feb 90 pp 1-2

[Interview with Vladimir Vladimirovich Khramov, deputy chief designer of the Space Instrument Making Scientific Production Association, by GUDOK correspondent Ye. Khrakovskiy: "The Railroad Functions of Space"]

[Text] **When flights into space were first begun, visionaries and even some specialists were saying and writing: in time, rockets will become the fastest means of communication. Obviously, this was euphoria, enthusiasm about**

the expanses that were being opened up. It is too expensive to transport people and cargoes by rocket, and it certainly is not safe, either.

All the same, space has begun to serve transport. Instruments installed on satellites are making it possible for ships to get their bearings accurately in an area and communicate with a shipping company at any time at any point on the world's oceans, and they are helping to rescue persons in distress. In other countries they have begun to utilize space communications to control railroad transport and to perform very important transport tasks on the ground. And with the conversion, the broadest opportunities are being opened up for us here as well.

Recently a meeting was held between Minister of Railways N. S. Konarev and members of the ministry's collegium with the general manager and chief designer of the Space Instrument Making Scientific Production Association, L. I. Gusev. A very broad range of operations which may be carried out for the benefit of railroad transport was outlined. The minister has issued a special directive. The first agreement on experimental design operations has already been concluded and is beginning to be implemented.

Our correspondent talks with Vladimir Vladimirovich Khramov, the deputy chief designer of the Space Instrument Making Scientific Production Association, about what the space system developers are proposing to speed up technical progress in railroad transport.

[Khrakovskiy] Please tell us how you first became acquainted with the railroads' problems. This does not involve the purchase of tickets on a company train, of course.

[Khramov] It was in the mid-1970's. Specialists at the VNIIZhT [All-Union Scientific Research Institute of Railroad Transport] asked us to develop a data acquisition and transmission system for testing diesel engines. They said that coming to us has helped the situation. Similar systems were described in American literature. There was a reference there that their firms involved in space work are developing and manufacturing them. So we began looking for persons engaged in this work here.

As you know, we have had experience in developing many different instruments, telemetry systems, and equipment capable of storing and processing a large volume of data. And we have helped the locomotive testers. Technical proposals are being drafted to develop a set of equipment for the VNIIZhT laboratory car, and we could provide the railroads' laboratory cars with this same equipment as well. But the question of additional financing has not been resolved yet. We are a cost accounting organization. It is not enough to wish to collaborate with the Ministry of Railways.

[Khrakovskiy] I hope the financial problems will be settled. After all, the ministry managers have taken an interest in your proposals and the railroads will come up with the money if they are convinced that the most advanced equipment is being developed for them. What else have you begun work on?

[Khramov] A contract for experimental design work has been concluded with the All-Union Scientific Research Diesel Locomotive Institute (it is the head developer) for the purpose of creating the "Lokomotiv" ASUB. This abbreviation has quite a long expansion: the automated control system to ensure the safety of traction rolling stock. It is being developed for new diesel engines, electric locomotives, and electric and diesel trains. But part of its subsystems may also be mounted on the locomotives being operated now.

[Khrakovskiy] What does this system consist of?

[Khramov] It is probably best to begin with the devices for driving the train automatically—an automatic train driver in the future. Depending on the alignment of the track, the weight of the train, the times assigned for passing over a section of track, and so forth, an electronic device will select the locomotive's best operating mode with the lowest consumption of diesel fuel or electricity. There can be two versions here. First, the on-board computer advises the driver on the display at which control unit position it is better to proceed at a given moment or when he has to begin braking. In the other version, the computer actuates the diesel engine, traction engines, and brakes through special instruments.

We are proposing that a special radio station be developed. It will make it possible to transmit digital information from one locomotive to the other for synchronization of their operation when coupled trains are being driven. I emphasize the word "digital." This means noise interference suppression. And it may be possible in the future, without apprehension, to allow the second locomotive to operate automatically without an engineer.

Now about diagnostics of the locomotive's technical condition—its diesel engine, traction engines, the crew, and electrical and other equipment.

[Khrakovskiy] They have been struggling with this for a long time in railroad transport, but unfortunately, there are no real achievements which could be applied in practice.

[Khramov] Our specialists have such experience, and it is very extensive as applied to space vehicles, of course. A similar device on a locomotive will be able to warn the engineer that a malfunction has developed somewhere or that it is about to appear. The necessary parameters of the vehicle's operation, wear and tear on its parts, and other data will be recorded in the memory. Now picture this: the locomotive passes by the station where a depot is located, the engineer presses a button, and this information is transmitted on a radio channel, decoded automatically and fed into a large depot computer.

[Khrakovskiy] Yes, there are remarkable prospects for diagnostics such as this. When there are data on the

actual situation, on the deterioration of the most important assemblies and parts, locomotives can be put in for repair when this is really required, not after a specific distance traveled or time of service. And assemblies and parts can be removed and reconditioned at a given time when they need to be. Data can be accumulated, analyzed, and generalized here, and then modernization of the vehicles can be planned and the requirements can be put forward to the manufacturing plants. It may be said that this is a revolution in locomotive operations! Please excuse the interruption. About 40 years ago when I was just beginning as an engineer and arrived at an electric locomotive depot, it was hard to even conceive of such a prospect.

[Khramov] Technology, especially space technology, is developing very rapidly. We also want what we have achieved and assimilated to be applied more rapidly in the national economy, and railroad transport in particular. This is one of the important tasks of the conversion that is now under way.

But let us continue our discussion on the components of the "Lokomotiv" ASUB. Diagnostics of the locomotive's condition, you realize, is directly related to train traffic safety. But provision has also been made for a number of devices especially aimed at this, primarily to guarantee stopping on a red signal. The existing devices, railroad specialists believe, are subject to malfunctions, and this sometimes leads to accidents and wrecks. We will also provide for strict control over adherence to the permissible speed that has been established and the restrictions regulated by warnings.

We do not intend to discover America here. We will base ourselves on the new devices in locomotive signaling and the automated braking control system (the ALSYe and SAUT) and certain other devices. And it is very important that we want to make these devices an integral part of the "Lokomotiv" ASUB so that they interact directly with the entire automated control system. It is planned to base the entire complex on advanced componentry.

[Khrakovskiy] I have heard that your NPO [scientific production association] is prepared to undertake the practical introduction on locomotives of devices to monitor the condition of the engineer, and that they are now being developed by medical personnel from the VNIIZhT and specialists from the Radio Engineering and Electronics Institute of the USSR Academy of Sciences. Existing methods and instruments for checking the locomotive brigade's alertness give rise to the most unfavorable criticism and sometimes even indignation from the people. They make the engineer nervous and irritate and distract him. They disconnect them, damage them, and curse them. The new instrument is also called upon to help the engineer to be in good spirits and efficient during a run, not to make him nervous.

[Khramov] I think that with our componentry we will be able to make an instrument in the form of a wristwatch, as our developers are planning. Sensors mounted in it will record certain physiological characteristics, integrated circuits will be able to analyze these data and adjust the instrument to a specific individual, and a miniature transmitter will be linked with the "Lokomotiv" ASUB.

The engineer's condition can be indicated on a special scale by a certain signal. If he is cheerful and active, the panel will confirm this. If the instrument has registered a deadening of alertness, some light or sound alarm will warn the engineer, and it will stop the train if he is drowsy. The brakes will come into action when his pulse is lost, that is, the instrument will take the place of the so-called "dead man's" button.

It is better to ask the developers firsthand how this instrument will operate and what it will react to. I will add only that since the innovation is so important and they want to introduce the instrument as quickly as possible both on the new locomotives and electric and diesel trains and the ones now in operation, we are prepared to speed up this work. The work is up to the developers, and we are waiting until they produce a schematic for the circuitry and a prototype model.

We are also planning to make a "black box," which is well known in aviation, for locomotives in advance of the ASUB system. It also can be installed on both the new locomotives and those already in operation. It will accumulate and store all the data which can be recovered now from the speedometer tape. If the specialists consider it necessary to incorporate the readings from some other sensors in the same diagnostic devices, let us say, they are welcome to do so. We are recording hundreds and even thousands of parameters for space vehicles in such devices.

[Khrakovskiy] And how will the locomotive "black box" differ from the ones in aircraft?

[Khramov] A special recorder is installed in aircraft. And all the parameters are recorded on a moving tape. But we propose to use an electronic memory based on advanced static, volatile devices. What has been put into the memory will not be erased when the power supply is turned off. They may also be working on such a system for aircraft now, but I do not know this.

Since the "black box" is connected to the speedometer, I will mention another one of our proposals. We are beginning work to develop an electronic speed-measuring device for locomotives. No, we do not have to invent the bicycle here. The measuring instruments which the militia use are familiar. Haven't you been fined for their readings of excessive speed?

[Khrakovskiy] Unfortunately, I do not have a motor vehicle.

[Khramov] We need to adapt an instrument like this to the locomotive. It has many advantages over the speedometer now being used. It measures not the number of wheel rotations, but the actual speed of the locomotive,

using the so-called Doppler method. This means that slipping and worn wheels do not affect its readings. It does not need a mechanical drive, which frequently breaks down.

[Khrakovskiy] But how accurate is this speed-measuring device?

[Khramov] I think that it will meet requirements.

We have one more development which is aimed at ensuring safety. In response to an order from the VNIIZhT, we are developing a laser unit to determine the relative coordinates of rail segments for a high-speed car-track measuring device. We hope that this instrumentation, which makes it possible to determine the condition of a line with a high degree of accuracy at high speeds, will be ordered by the railroads as well.

[Khrakovskiy] A "black box," a device for measuring speed accurately, and a laser track-measuring device will help us to get to the root causes of railroad accidents, of course. But railroad men know that after a wreck it is very important to restore train traffic as quickly as possible. But for the investigation into what actually took place, it is absolutely necessary to record the picture right after an accident. And I am convinced that the mobile points for on-the-spot television coverage from the sites of accidents and natural disasters which you are proposing would be most welcome here. How do you visualize them?

[Khramov] We have experience in organizing communications on satellite channels. Our enterprises are manufacturing equipment for these purposes. And we are suggesting to the Ministry of Railways that an installation for television coverage be set up in some car of a wrecking train, let us say. Assume that a car with this installation arrives at the site of a wreck. And with aid of a portable television camera the entire scene in all its detail is transmitted in color to the railroad administration or to the ministry.

The coverage is not hard to record on videotape and afterward, during the official investigation of the accident, if it is required, it can be run through as much as necessary and stopped to carefully examine some detail.

[Khrakovskiy] Can this television reportage be conducted from any point in the country's railroad system?

[Khramov] Very likely, yes. We need only determine if the sections that are farthest to the north fall within the area of coverage of existing satellite communications.

[Khrakovskiy] Won't a special satellite be needed?

[Khramov] Why do we need one if the existing one can be used? After receiving authorization from the organization to which it belongs, of course. I do not think this will create big problems. Generally speaking, we are suggesting that thought be given to the establishment of departmental satellite communications. This is a very expensive matter. And it must be analyzed; perhaps one satellite is capable of serving the employees of several sectors at once—railroad workers, power engineering workers, gas workers, and geologists, as an example. If the volume of all the different railroad information is too great, the Ministry of Railways probably will be justified in launching its own satellite.

[Khrakovskiy] Now, at a time when an automated control system for railroad transport is being developed, we are experiencing a critical shortage of communications channels for data transmission. We have to lay expensive cable lines many thousands of kilometers long. Perhaps the satellite will replace them, but what will this cost?

[Khramov] Specialists from the Ministry of Railways and its institutes have told me that satellite communications may prove to be less expensive than cable lines over long distances. The complete set of transmitting equipment will be significantly less expensive than laying cable between stations.

[Khrakovskiy] And how do you conceive of the entire system for controlling the transport process at an advanced level?

[Khramov] Just as the lead specialists in the Ministry of Railways do. First of all, we must resolve the problem of collecting data from moving locomotives and cars. We have suggested a version of such a system. There are several methods of identifying rolling stock, or stated more simply, of reading the data from cars and locomotives. We are prepared to begin developing any one of them. This is our NPO's specialty, we may say.

[Khrakvoskiy] But which devices are more preferable, in your opinion?

[Khramov] There are a number of domestic and foreign developments. As an example, a passive sensor is installed on a car. It does not emit anything, so it will not harm anyone. Morover, there are very simple and inexpensive parts, and it is unlikely that hunters will be found removing them from cars. An excitation source will be set up at a station. When a response is received, it will identify the encoded car type and other necessary data. There are also other methods of marking cars developed by the Ministry of Railways, and we are prepared to use any one of them.

Data on all the locomotives and cars that have passed can be transmitted from the station by wire or satellite communication to the railroad's dispatch center or to the ministry. So it will be easy for the ministry to determine where a certain car is at a given moment and what freight it is carrying, and to see the overall picture of the transport process continuously in real time over the country's vast territory.

It is best to begin development of the overall system with refrigerator cars. For this purpose we can use active

sensors—transmitting devices. The location of refrigerator cars equipped with such instruments can be determined through a system of land-based or satellite communications. Tests in using satellites for this purpose were conducted last year.

Why should we work primarily with refrigerator cars? First of all, they carry perishable products and it is especially important that they be watched. Secondly, a power source and servicing personnel are on them. Our enterprises are turning out such equipment, and we are prepared to adapt production of it for railroad tranmsport as well.

[Khrakovskiy] How much can a set of this equipment cost?

[Khramov] From several hundred to three or four thousand rubles. I believe that an economic calculation will confirm that the costs will be recovered quickly as a result of better use of the refrigerator car fleet. I will not repeat the widely known figures of the losses incurred because perishable products are not delivered to consumers on time.

[Khrakovskiy] I was automatically overjoyed when I heard your account of the very wide range of prospects which the conversion is opening up for railroad transport. But there is a gnawing doubt: won't the space researchers be undertaking too much on earth for that purpose in order to stay afloat for some time, as they say? And afterward, when the state is able to provide liberal financing for space development, they will easily abandon the transportation problems, bringing nothing to the point of practical introduction?

[Khramov] I will not venture to interpret how the entire sector will conduct itself under such conditions. I answer for my collective. I am convinced that if the cost accounting system is functioning, enabling a person to earn as much as he wishes and is able to earn, all the fears are unfounded. Generally speaking, if wages are not restricted, our designers and employees will bring the work to completion.

[Khrakovskiy] The fact that your NPO is interested in doing business with a reliable customer such as the Ministry of Railways probably plays a role here as well. This is a state firm that is solvent, and it will stay that way through all the changes in the economy.

[Khramov] Everything cannot be reduced to money, even under cost accounting. There is simply interest as well. We are not working with irons or other everyday items. With the scientific, designing, and production potential that we have! I am deeply convinced that in the conversion, a collective has to undertake what it knows and knows how to do, what it has already achieved. In developing the devices we have mentioned, we will be working with the systems that are familiar to us: all kinds of sensors and equipment for processing, storing, and transmitting data, and so forth. We have been working with all this for many years in developing space systems.

[Khrakovskiy] But won't your specialists have to thoroughly examine the specifics of railroad transport, after all?

[Khramov] We have organized a very good contact with the TsT [Locomotives Main Administration], the appropriate departments of the VNIIZhT, the All-Union Scientific Research Diesel Locomotive Institute, the VNIIZhG [All-Union Scientific Research Institute of Railroad Hygiene], and certain other organizations.

[Khrakovskiy] Can the fact that you are using the abbreviation TsT instead of the full name of the Locomotives Main Administration be considered evidence of a close relationship as well?

[Khramov] Yes, we have full mutual understanding here, a contract has been signed, and we have begun working together.

[Khrakovskiy] They say that other organizations are competing with you in solving the communications problems, and that the Ministry of Railway specialists are at the crossroads: to whom should they give preference?

[Khramov] It is very good when there are competitors. They proceed in this manner in such cases: they announce a competition, they formulate the criteria for it and the objective itself. We are prepared to take part in such a competition.

[Khrakovskiy] Let us say that you plan to manufacture compact, reliable portable transceivers for railroad workers, but do you have as powerful a production base to produce such items as the enterprises that have specialized in their mass production?

[Khramov] Now, under the conversion, our capacities are being released as well. Our production is quite strong. We make a great many items ourselves, including integrated circuits. We can compress the dimensions of equipment because of this. Although we obtain some of our componentry from outside, of course.

[Khrakovskiy] There is no doubt that it is up to the transport specialists to decide which proposals to accept and which ones not to accept. Sound economic grounds are also needed in order to know how to proceed. But I do not think we can overlook such an opportunity to speed up technical progress in railroad transport.

November Rail Safety Reported

904H0100A Moscow GUDOK in Russian 29 Dec 89 p 2

[Materials of the Main Administration for Traffic Safety of the Ministry of Railways: "Traffic Safety—November"]

[Text] Last month the railroad network had five wrecks as against the four that occurred in November of last year. On the Volga road a violation of the rules of shunting operations led to the wreck of a passenger train. The diesel locomotive and baggage car went off the rails.

A fire started in the locomotive. Fortunately, none of the passengers and service personnel suffered.

On the Samur-Derbent section of the Makhachkala Division of the North Caucasus road on 9 November, a freight train, after going past a stop signal, collided with the rear section of another freight consist standing at the entry signal of the station. The electric locomotive and five cars were derailed. At the Pskov Division of the October road, a freight train was wrecked due to a break in the rails.

On 22 November, at entry switch No 2 of the Pereval station of the Severbaykalsk Division of the Baykal-Amur road, when a freight train was entering, eight coal cars were derailed. The reason for the derailment was that the unsecured left point rail had been forced off the stock rail due to the pressing of the snow. The following circumstances, preceding the wreck, came out at the inquiry.

On 5 November, switch No 2 was forced open by the maintenance personnel car of a construction-installation train. Five days later the construction workers replaced the damaged point rails at this switch, securing them for traffic in the direction of the main track. A traffic speed restriction of up to 15 kilometers per hour was established, which is attested to by the appropriate entry in logbook DU-46. When the consequences of the forcing open were eliminated, they did not replace the deformed first point throw rod and disconnected it from the electric drive.

On 19 November, when inspecting the interlocked points at the station, an STsB [signalization, centralization and blocking] electrician, having discovered the consequences of the forcing open, disconnected the switch from interlocking before eliminating the malfunctions and asked the road foreman to transfer the point rail for traffic along the straight direction, which, judging by the entry in the journal, was done.

In reality, from 10 to 22 November, the switch was repeatedly rewired, without the participation of the station workers, to pass through diesel locomotives and maintenance cars going for refueling. No corresponding entries concerning this were filled out in logbook DU-46, and none of the workers involved monitored the securing of the point rails.

Thus, the communications workers, the track workers and the station workers and their director, for almost a month, corresponded with each other about one switch, without eliminating its malfunctioning. Unfortunately, the directors of the division and the signalization and communications services, who had gone to this station on 12 November and approved opening it for continuous train traffic along the main track, did not notice their irresponsible attitude toward safety.

Another case that ended in tragedy occurred on 28 November at 0610 hours. Two freight trains were involved in a wreck at the Rudnyy station on a single-track section of the Murmansk Division of the October road. When the head section of train No 1611 passed the entry signal light with a green light and was between the entry signal light of the station and the entry switch, this switch spontaneously threw over to a side track, which was occupied by train No 2146.

As a result of the head-on collision, the locomotive brigade of train No 1611 was killed: A. Plyusin, the engineer of the electric locomotive of the Kandalaksha depot, and N. Malikov, the assistant engineer. A. Limonov, engineer of the up train, and Ye. Glazychev, assistant engineer, were injured and taken to the hospital. Two locomotives and 18 cars were put out of operation. Train traffic was interrupted for over a day.

The changes introduced by the Murmansk track section in the signalization and communication system of the automatic block of the Rudnyy station, with deviations from the technical decisions and requirements of paragraph 6.25 of the PTE [Regulations for Technical Operation], were the cause of the accident. In addition, they were made without thoroughly checking that the action of the system worked correctly after the change in the switch installation.

Upon investigation, analogous violations in the systems were also revealed at other stations of the Murmansk Division. What if this convergence of circumstances had arisen during the entry of a passenger train or when it was standing on a side track?

The number of accidents as compared with November of last year dropped somewhat (5, as against 7), and there were passenger train accidents on the Moscow—2, and the Dnepr roads.

Another alarming factor must be noted—the violations of the rules of safety on train tracks involved. A scornful attitude toward adherence to the requirements of the PTE and instructions has been observed among some station workers and shunting locomotive engineers, as soon as they go beyond the station limits. The result of this can be seen from this example.

On the night of 7 November, a consist of trains of the Krasnograd station on the Kharkov Division of the Southern road left a group of 5 cars, secured by two chocks, on an approach track with a slope of about 20 thousandths. An hour later the cars started moving and collided with a shunting consist. The engineer died as a result.

What did the investigation reveal? The track was maintained in extremely unsatisfactory condition. The stop blocks were forced out at a joint with broken fish plates. There was no lighting. The data on the profile of the track on which the calculation of the securing norms were based did not correspond to the actual facts.

In November, locomotive brigades went through stop signals 12 times. It was only by chance that there were no wrecks as a result.

An example of creating the prerequisites for accidents is the fact that on 18 November a freight train on the Far Eastern road stopped because the locomotive brigade fell asleep, and rolling back, collided with the consist following it. As a result, the diesel locomotive and 3 cars of the refrigerator section were damaged. Traffic was interrupted for over 5 hours. It was established: the mechanism device on the diesel locomotive that warned of going backwards proved to have been turned off. Moreover, this diesel locomotive had gone through TO-2 [technical service-2] the day before the accident. Incidentally, at the Khabarovsk-2 depot, another nine locomotives were discovered to have safety devices turned off.

Engineer Konovalov, born in 1963, had been driving a freight train and exerting his utmost efforts since 1986. He was described favorably. He rested 24 hours before a trip. But because of his move to a new apartment, as it turned out, he had had practically no rest. After reporting for work at the turn-around depot at Bikin, he appealed to the dispatcher with a request that he not be sent on the trip. They did not give a replacement for him, though, and now everyone is wringing his hands and cannot understand how he could fall asleep in the locomotive. Here is a graphic example of a callous attitude toward people!

On the whole for the network, the number of cases of flaws in November was reduced by 9.6 percent as against November of last year. An increase in the number of flaws was committed in the track and electrification services, where unsatisfactory preparation of the wheels and devices of the contact-wire system have an obvious effect on work under winter conditions. The Belorussian, Moscow, Southern, Donetsk, South Urals and Baykal-Amur roads permitted an increase in the number of flaws.

As before, grade crossings are worrisome. The number of collisions with motor transport is growing.

Rail Tariff Changes Noted

904H0100B Moscow GUDOK in Russian 4 Jan 90 p 2

[Article: "Changes in the International Railroad Transit Tariff (MTT)]

[Text] From 1 January to 31 December 1990, new tables of tariff rates and line charges for transport and new rates for additional dues (Part V, sections II and III) were introduced in the International Railroad Transit Tariff (Tariff Handbook No 31, 1986 Edition).

The new charge for transport and additional dues is published in the Collection of USSR Regulations for Transport and Tariffs of Railroad Transport, No 374. Until this collection, with estimates for freight transport, adopted after 31 Dec 1989, is received, the rates existing up to this time, published in the USSR Collection of Regulations for Transport and Tariffs for Railroad Transport, No 341 should be used, increased by a coefficient of 1.1034.

During this period, in Section II of Part II of the International Railroad Transit Tariff, in paragraph 27, "Protection Cars," specified in item 1, the charge is established in the amount of 0.08 rubles, and in paragraph 30, "Passage of Train Attendants"—the amount of 3.26 rubles.

For estimates for the transport of large containers in railroad services from the Mongolian People's Republic in 1990, the new rates of Tables IV and V of Section II Part V of the International Railroad Transit Tariff have been reduced by 82.31 percent.

New Rail Boundaries Set

904H0100C Moscow GUDOK in Russian 4 Jan 90 p 2

[Article: "New Rail Boundaries and Divisions"]

[Text] For higher quality and more complete satisfaction of the demands of the city of Komsomolsk-na-Amur for railroad transport, the section from Komsomolsk-na-Amur-2 siding to Silinka siding was turned over to the Far Eastern road. The boundary between the Baykal-Amur and Far Eastern roads was established along the Silinka siding exclusively for the Far Eastern mainline. The directive of the Ministry of Railways of 18 December 1981, No 2729 is considered to have lost force.

Because of the acceptance of the Rybnoye-Uzunovo line for continuous operation, the section Uzunovo to the 60-km halt (inclusive) became part of the Kashir Division of the road. The section from the 60-km halt (exclusive) to Rybnoye went to the Ryazan Division of the road. The boundary between these divisions was established at the 60-km halt inclusively for the Kashir division.

The section Aktogay to Druzhba of the Semipalatinsk Division of the Alma-Ata road was turned over to the Alma-Ata Division. At the same time the section Aktogay to Sayak was established at the Aktogay station exclusively for the Alma-Ata Division.

Railway Economic Structure Needs Reorganization

904H0083A Moscow GUDOK in Russian 16 Dec 89 p 2

[Report by GUDOK correspondent Yu. Vakhrin on railroad workers conference: "Economic Levers or a Firm Hand?"]

[Text] **Readers were firing off telegrams to the editorial staff every day that the All-Union Railroad Workers Conference was in session: what is happening in the forum? Are they resolving anything or are they just talking shop again? I think that readers have caught the**

spirit of it from GUDOK's recent articles on the conference: the delegates have not only been "hammering in" a question, but have even been suggesting their own version of an answer. As far as a definitive solution to all the problems that have accumulated in the sector is concerned, I want to give some thought to this. The meeting provided food for one of the sections, which was called "Improving the economic mechanism and management." Despite what was expected, it brought together not only economists and finance managers; 18 railroad chiefs not only paid attention, but eagerly took part in its work, and five of them spoke out.

The spirit of the conference was reflected in the statements by N. Belogurov, chief of the Central Asian Railroad, and O. Bachin, a locomotive engineer from the Krasnoyarsk Railroad, which were published in GUDOK a week ago. One of them tells about the search for a new management structure for the sector—one that is more suitable to the present stage, multifunctional and diversified, and the other one asks the question: do we need the railroad divisions? Incidentally, nothing has prevented—or is preventing—the Krasnoyarsk workers themselves from looking for ways to improve the structure of their own railroad, after all. About 5 years ago the ministry made an urgent appeal to this mainline to engage in an experiment: try to work without the divisions. They have three of them in all, and they serve one economic region. As an eyewitness of events I can attest to the fact that the railroad "generals" have not made an objection or offered resistance, but they have not displayed initiative, either. Everything faded away by itself somehow.

I write this with the secret hope that perhaps the Krasnoyarsk Railroad collective will give a little more resoluteness to their commanders' actions. In any event—and this was a painful note in many of the section's speeches—the sector appears to be in the dark at a difficult, critical moment. Where does it move ahead? There is no experience and there are no results of experiments which answer this vitally important question—we have not "worked it out," we were not prepared, and even now we are still biding our time and worrying.

Yes, it is unnecessary—always a hindrance to the work. It would not be a bad idea to remove an intermediate component that is unnecessary. And if this were the only problem, how simple everything would be. However, I am convinced that even if there is a Ministry of Railways order tomorrow abolishing the divisions, the problem of managing the sector will not be simplified.

The modest store of suggestions on restructuring management provided by the Lvov, Central Asian, Belorussian, and October Railroads does not have the usual straightforwardness: "do away with the division or the line." The search follows another path. They are seeking out the best possible combination of administrative and economic methods of management. And economic levers remain predominant. It cannot be otherwise. It is a different time today, the sector is not the same as it was 40 years ago, and the goals and tasks facing it are different today.

The very attempt to unite administrative and economic levers was subjected to question first of all. N. Isingarin, chief of the Alma-Ata Railroad, conveyed this position most categorically and pointedly, in my view. "The sector has two alternatives: either state railroads, with all the consequences and obligations of the state and the public which ensue from this, or full cost accounting with market relationships."

"I don't know what, but something is unnecessary here, either the division or the line." This opinion amazed me, I must admit. For the first time in my 7 years of working at GUDOK, I heard this from the lips of a finance manager. And one more observation from last summer. I had occasion to visit three railroads, and everywhere it was the same—cutting back on the "merchants" in a noisy and rowdy fashion, but steadily. For some reason they turned out to be the most unnecessary and exposed.

These examples, in my view, characterize the functioning of the new economic mechanism in transport very accurately. Exactly like the nonfulfillment of the income plan by a number of divisions and lines, the increase in wasteful losses, and the rise in operating expenditures against the background of declining work volumes. The year has been difficult for the railroad workers, of course: the strikes, the decline in shipping even at the enterprises that are operating continuously, and the disastrous shortage of rolling stock. But there has been no unrestrained pursuit of profits as in light industry, for example, with the notorious price indexes for various "contractual" contrivances. Few ran the risk even with contractual tariffs.

But now a brief quotation: "What is the main defect in the present economic mechanism, in my view? It stimulates the earning of as much profit as possible." This is from the report by V. Pryadko, the chief finance official of the Ministry of Railways. Well, what is a better incentive for zealous management of the economy, if not profit?

But let us return to the report. "The main source of profit in transport is the shipment of goods, and its increase leads to a rise in the transportation outlays of the national economy. The cost accounting interests of the sector and the state conflict in this case. How is this to be resolved when no one has given an answer, including academic scientists. Unfortunately, we do not have a well-considered theoretical basis for building an economic mechanism in transport. I think that both command methods and economic levers are necessary. And everything should be subordinate to a single objective—completely meeting the demands of the national economy and the public for transport in a timely manner with high quality."

The section worked for a day and a half, turning down a trip to Shcherbinka. But during that time it was not able

to provide a formula for harmonizing relations between the state and the sector. Although these contradictions are tearing apart all the large and small collectives with problems, from the ministry main administrations to the smallest siding. For this reason, someone in the section attacked the notorious "gross output," then defended freight turnover, because "you won't think of anything better, anyway." Some speakers blamed the lack of systematic economic analysis of expenditures in the dynamics, and others criticized the attempts to introduce accountable norms of production cost into the system.

The representative of the Rtishchevo Division plunged the presidium into serious thought with her question: why establish intensity of freightturnover for a division if the trains have not been shortened, but the proportion of empty cars in transit has visibly increased? How are we to explain to persons why their wage will be reduced with the arrival of new instructions from the ministry?

Questions—not this one, but others of a similar nature—will be raised in the future as well. Because the situation in the sector is such that if the functioning of economic laws is not abolished, it will be modified by instructions, norms, and targets. Reports by managers of the main administrations in the section stated in plain terms that relationships between enterprises and the ministry will be built on the basis of administrative subordination. But economic methods should be developed further together with the command and administrative methods of management. And it is already clear that the place for economics is from the line management and below.

But what is the cost of even local cost accounting, as it is usually called, without horizontal or vertical ties? The financial manager of the Korosten Division of the Southwestern Railroad, N. Grinevich, worries about the lack of coordination in economic relationships with neighbors. He has been forced to take financial losses into consideration at regular intervals. The reason is there is a surplus of cars because other divisions and railroads have not accepted them. He has to look for money for the locomotive depot, because one-fifth of its work is performed on neighboring lines and divisions. And he sees the solution in establishment of a system of contracts. But economist I. Myshkovskiy distinguishes his opinion in the measured formula: "Contracts are a bureaucratization of cost accounting."

"It is customary to think that structural subunits do not create an end product," stated Ye. Ayzenberg, a professor at the Rostov Institute of Railroad Transport Engineers. "This is a groundless statement. Transportation is a service. The sum of the Ministry of Railways' activity is services. But the sum of a structural subunit's activity is also service. And it can and should be evaluated by the proportions in the incomes of the ministry, the railroad, and the division. If we do not resolve the fundamental problem of the economic independence of the line enterprise and the structural subunit in a new way today, we will have the same situation that is now taking place in the coal industry."

"The masses demand everything in accordance with calculated norms, then the line enterprise is ready to shift to cost accounting," adds N. Oksyuzyan, chief of the economics department of the Vladivostok Division, Far Eastern Railroad. "But no one even wants to speak with the division about calculated norms. Today the division has appeared before everyone as 'the main obstacle to perestroyka,' as a gathering of bureaucrats. The ministry must accept a share of responsibility for itself."

"I ask my esteemed comrades from the ministry to please remove the word 'self-financing' from all the sectorial documents," Ye. Mikhaylova, chief of the financial department of the Moscow Division of the October Railroad, began her speech.

"This is clearly a superfluous word, because like everything else that we earn, it goes into the railroad income, and they allocate funds to us only for wages. There are only fines all around. No additional profit for improving quality or quantity indicators is due."

There were no frivolous speeches in the section. They were not restricted by criticism. There were interesting opinions, and even an advertisement of personal experience. For a suitable fee—in the spirit of cost accounting.

But the suggestion by a scientist from the VNIIZhT [All-Union Scientific Research Institute of Railroad Transport], N. Kulagin, was introduced for the section's consideration.

"We need an assault with brainpower on the most fundamental problems in the functioning of the economic mechanism in the sector. We need to set up groups of specialists on central questions and to bring scientific VUZes and the most experienced persons together. And then to summarize and bring all the suggestions together."

There was a stir in the hall when one of the speakers described the system of cost accounting now in effect in transport as "vertical-pressure." And laughter broke out in the rows when section leader V. Pryadko revealed a small secret: the author of "the new word" in science was one of the developers of this cost accounting system.

I. Shevandin, chief of the Southeastern Railroad and also one of those who developed the current economic mechanism, recalled the pace at which the authors of the legalized economic model had to operate.

"There simply was no time to weigh the results of the experiment in industry and to develop them by taking the specifics of the railroad sector into account. For this reason," he acknowledged, "the criticism is justified. But aren't we losing precious time even now? Everyone is waiting for something, and no one is making up his mind to experiment. What awaits us tomorrow? What will we enter the new five-year plan with?"

Other statements expressed confidence that there is nothing to worry about, that the answers to questions already exist. First of all there is the program for technical reequipment and modernization of the railroads in the coming decade, which will require over 150 billion rubles, let us point out. And secondly, the forthcoming legislative consolidation of railroad transport as national property.

Both these conditions define the tactics for functioning of the economic mechanism in transport in the transitional period of development of the country's economy rather than provide the key to a solution of the the sector's strategic tasks. It is to be hoped that funds for the technical reequipment of the sector will be found.

And if not? We all can assume this possibility, inasmuch as we have been sufficiently informed about the status of the state budget today. We will have to propose some ways to locate the funds needed. As an example, by preferential taxation or from different indirect sources of supplementing the budget of the sector itself. Such examples are provided from experience in other countries.

The combination of problems related to the interaction of the different forms of property requires serious and realistic study. We need a search for harmonious combinations of national property and the property of republics and autonomous formations.

Ya. Leshkin, chief of the Estonian Division of the Baltic Railroad, said that "even today the labor collective of the division is in the most difficult situation. What will happen tomorrow?"

The Baltic republics' shift to independent economic operation with adoption of the appropriate legislative documents opens much broader opportunities for local enterprises than before. And while the loss of railroad personnel is considerable today, this process will be accelerated tomorrow.

"The Estonian Government," Yakov Fedorovich continued, "is giving railroad workers full independence even today, particularly in setting rates which make it possible to eliminate the unprofitableness of suburban and passenger transport. Other economic innovations are not being ruled out, either. A package of proposals worked out in the division and supported by the ministry was sent to the union Council of Ministers 2 months ago, but there has been no answer."

"The coming regional cost accounting has already provoked impetuous independent activity in local areas. Oblasts are apparently competing to see what kind of tax can be devised," continued F. Kotlyarenko, chief of the North Caucasus Railroad. "You just have time to go out and suppress all these ambitions. And our railroad consists of 11 administrative-economic rayons, krays, autonomous oblasts, and an ASSR. We must frankly confess that we are not preparing for the country's shift to regional cost accounting. The Ministry of Railways has not been represented in any way in the territorial organs, and none of us have been given such representative powers. That is why the interests of the sector and the railroad's labor collectives will be ignored. And generally speaking, the extraterritoriality of the railroads is still only a slogan. An economic and juridical basis is needed for this principle."

There is no adjustment in such questions, either. As an example, the Gosbank's relationship to a railroad is the same as it is to a cooperative. Crediting of a shipper for transport expenses has been discontinued, and after completing their work, railroad workers have no funds in their accounts and are forced to obtain credit on their wages at exorbitant 10-percent interest.

For the sake of fairness we must say that part of these and other problems have been presented to the USSR Council of Ministers for solution in the concept mentioned, and it has also been reflected in the Draft Law on Railroad Transport. However, a fair opinion is worth noting: it is not enough to write a new law or to update the old one with new provisions; we must also see that the law works.

Railroad workers can be grateful to those who have taken part in discussing economic development problems. The individual, his concerns and anxieties and his work and everyday problems, have been put in the forefront.

The railroad worker's lack of social protection today and the harm done to his position is so evident that not even figures are needed for proof, it would seem. But N. Khovanskiy, deputy chief of the Gorkiy Railroad, cited statistics on the social development funds and the wage fund per worker in the oblasts being served by the railroad and in the industrial enterprises in various sectors, compared with the railroad workers. And frankly speaking, it made me feel uneasy. "And there are no prospects at present that social justice will be restored," Nikolay Iosifovich noted bitterly. "The increase in freight rates, according to our calculations, only makes it possible to compensate for the increased prices for diesel fuel."

N. Isingarin, chief of the Alma-Ata Railroad, interpreted the problem of forming a centralized ministerial fund by way of "the human factor," as an example. First of all, they are calculating it with various correction factors: more from one person, and a little more freely from another person. Secondly, they are not spending it uniformly: one who "pulverizes" equipment barbarously also receives new equipment sooner. Wage leveling on a ministerial scale hits the hard worker first of all.

Many of those who spoke linked the functioning of the new economic mechanism with the psychological factor in one form or another. Difficulties with development of cost accounting at the local level stem from people's uncertainty and distrust of what is new, it was noted. But stability in the conduct of economic policy in the sector is essential to move ahead.

And we cannot shift from side to side: today leasing is authorized, and tomorrow only the leasing contract, and nothing else. There are enough discussions on cost accounting as a school of economic operation at the local level, when only collectives of the so-called structural subunits are moving ahead to experiment and search. At the same time, they are not making hardly any commitments on a little higher level.

A new system for training economists in transport is necessary to restructure the economic mechanism. And a system for retraining them. According to an analysis by the RIIZhT [Rostov-on-Don Institute of Railroad Transport Engineers], the level of education of the managers (especially of line enterprises) is extremely low. For this reason, both a system for retraining personnel and a new system for training economists must be introduced. But no matter how many new specialists we turn out, no one will stay too long at railroad enterprises with the wage that an economist receives today.

The idea of drawing apart the walls of discussion on professional problems and of holding a conference in due course of economists, finance managers, and supervisors of various ranks has been advanced. Let us hope that this idea is not lost in the workaday routine. This is how the resoluteness of scientists and specialists will be realized to brainstorm the most burning theoretical and practical issues, and how the economic mechanism and management in transport will be improved. So a continuation follows...

Officials Blamed for Poor Rolling Stock Use

904H0085A Moscow GUDOK in Russian 17 Dec 89 p 2

[Unattributed report: "The Losses are Increasing and the Fines Are Increasing"]

[Text] **People's control organs have called 440 managers to account for their irresponsible use of rolling stock.**

People's control officials have been turning their attention to work in the sector more and more frequently lately. Unfortunately, there are more than enough grounds for this. Let us compare just two figures: out of 35 million tons—this is transport's financial obligation in freight handling since the beginning of the year (over 3 days' work in the system)—26 million were accumulated over the 2 months of September and October.

What conclusions were reached by the KNK [Committee of People's Control] about the reasons for such a sharp drop in the pace? They are traditional enough: constant disruptions in the unloading of cars at many enterprises, especially at night and on days off and holidays. More than 200 million rubles in fines were paid to railroads for rolling stock layovers on the sidings of shippers and consignees from January to October. More than 220,000 cars were not unloaded in the established periods of time since the beginning of the year by just enterprises of the Ministry of Metallurgy [sic]—the Ministry of Railways' largest client. The losses increased over the corresponding period last year by 20,000 units, and the fines increased by 22 million rubles.

This kind of economy with a minus sign is natural: the development of transport still lags behind basic production and steps are not being taken to supply it with the necessary freight-handling machinery and facilities for thawing out loads. USSR Council of Ministers Decree No 645 of 4 June 1987 "On steps to improve the work and further develop industrial rail transport in the 12th Five-Year Plan" is not being implemented by the ministry. In the current five-year plan, 140 kilometers of track have not been laid, 24 car dumpers and 19 garages for thawing out freight have not been set up, and 40 railroad car scales and 80 unloading cranes have not been put into operation. About 200 million rubles allocated for these purposes have not been used.

And how can we forget the recent jams at the border which no paper could avoid giving attention to. As a rule, it was only the railroad workers that caught it in the articles. The Committee of People's Control accented the matter differently. The clearly unsatisfactory role of the foreign trade departments was mentioned. Export freight for which no foreign consignees had been specified was being shipped to seaports and border stations in large amounts. Over 50,000 tons of paper, metals, and other freight without purchase orders were found on platforms and in warehouses in the port of Reni. Hundreds of railroad cars with fertilizers are standing idle on the Far Eastern and Transbaykal Railroads. These loads often becomes worthless.

For example, there were 3,762 containers of export goods, including 1,720 units without purchase orders, in the port of Ilichevsk on 13 November this year. Some 1,057 of them belong to the All-Union Association Legpromeksport of the State Committee for Light Industry, attached to the USSR Gosplan; 280 of the containers have been at the port for 3 to 6 months, and 207 have been there up to a year or more. For more than 3 months 188 heavy containers have been held at the port of Vostochnyy, 390 containers have been held in Leningrad, 250 in Izmail, and 87 in Riga.

In the contract concluded with the port of Ilichevsk, up to 1,000 containers without purchase orders are not included in the official records on their availability and layovers.

Many complaints are being made about the unsatisfactory work of the October Railroad. The mainline has not transported hundreds of thousands of tons of petroleum products, iron ore, and mineral fertilizers. Unproductive layovers of the fleet because of failure to turn over the cars have increased over last year, and foreign exchange losses add up to about 3.5 million dollars. The railroad has paid shippers 3.8 million rubles in fines for its failure to deliver goods.

Constant disruptions in unloading and car layovers in excess of the norm are being tolerated by the USSR

Gossnab, the USSR Ministry of Railways, and the USSR Ministry of the Maritime Fleet.

Transport capabilities are declining as a consequence of poor work by the car preparation points because of poor material supply. The most disruptive delays in delivery were permitted by production associations of the USSR Ministry of the Timber industry. Only 82 percent of the 10-month plan for unloading lumber for the Ministry of Railways has been fulfilled.

People's control organs have called 440 persons to account for unloading late and poor use of cars in September and October; 164 of them were fined for a total of nearly 50,000 rubles. For example, B. Veselov, the acting general manager of the Legpromeksport Association of the State Committee for Light Industry, attached to the USSR Gosplan, will have to pay 720 rubles.

Reprimands were given to A. Zaytsev, chief of the October Railroad, and to V. Pankrushin, USSR deputy minister of metallurgy.

Statements were accepted from G. Fadeyev, USSR deputy minister of railways; V. Burmistrov, USSR deputy minister of foreign economic relations; I. Sankin, USSR deputy minister of the timber industry; V. Pankrushin, USSR deputy minister of metallurgy; and N. Tsakh, USSR deputy minister of the maritime fleet, that the ministries will take urgent steps to correct the shortcomings noted.

New Automated Information System on Krasnoyarsk Line

904H0091A Moscow GUDOK in Russian 20 Dec 89 p 2

[Article by V. Rakov, Krasnoyarsk, under the rubric "Catalogue of Innovations": "*Tsikl* Knows Everything"]

[Text] *Tsikl* is the name of the automatic information system equipping the signals and communications service of the Krasnoyarsk Railroad Administration. It has been executed in the form of a map diagram of the dispositions of line sections. It is equipped with colored signals that illuminate those blocks of data that could elicit interest.

Tsikl is 15 basic indicators of the system. Say you need the collectives that are most skilled and competent for the maintenance of signals or PONAB devices. No problem! The chain of lights in the first instance lights up at the stations of Koshurnikovo, Sayansk and Achinsk-1. In the other case, signals and communications subdivisions 4, 6 and 7.

Or what if you want to find out who among the communications workers has been awarded the Outstanding Red Banner for success in competition? The workers at Abakan, Uzhur and Sayansk. Where do the communist labor teams work? Achinsk, Abakan and Sayansk again. *Tsikl* knows everything.

Microprocessor Aids Locomotive Operation

904H0091B Moscow GUDOK in Russian 23 Dec 89 p 2

[TASS article, Voroshilovgrad: "Electronics Drive the Diesel Locomotive"]

[Text] The engineer pushed a button, and the locomotive moved slowly from a standstill without slippage even though it was coupled to a heavy train. The optimal operating mode for the railroad locomotive was "suggested" by the microprocessor technology with which the collective of the Voroshilovgradteplovoz [Voroshilovgrad Diesel Locomotive] Association has begun to outfit its equipment.

They are striving for high efficiency in the operation of machinery with six thousand horsepower with the aid of an electronic regulator that was created by a group of sector institutes. Their gradual "inclusion," especially in getting the locomotives started from a standstill, will make it possible to achieve the better adhesion of the wheels to the rails. The weight of the consists being transported can be increased by at least ten percent, and the consumption of diesel fuel reduced, through this alone.

The need to follow blindly the strict instructions obliging them to put the locomotives in for repairs after 10,000 kilometers of run time diminishes when the diesels are equipped with electronics. The degree of wear and tear on the locomotive is now determined by special sensors. They will regulate the braking system as well, which will make it possible to raise the safety of train traffic.

Rail Plan Performance Examined

904H0091C Moscow GUDOK in Russian 22 Dec 89 p 1

[Article from materials of the Statistical Administration: "There is a Plan for Four Years!"]

[Text] The workers of rail transport fulfilled the plan for the first four years of the five-year plan on December 21. About 109 million tons of national-economic freight were shipped above and beyond the plan before the end of the year. The results could have been more substantial. The volume of shipments above and beyond the plan, however, dropped by 32 million tons due to unsatisfactory operations this year. This included 11 million tons of coal, 9.5 million tons of petroleum and petroleum products and 11 million tons of chemical and mineral fertilizers. Only 95.6 percent of the product mix of state orders was shipped in timber freights, along with 98.8 percent in fusing agents and chemical and mineral fertilizers.

Some 15 railroads were able to fulfill the four-year plan by December 21. The Gorkiy, Donetsk, Azerbaijan, Transcaucasus, Volga, Kuybyshev, West Siberian and Far East railroads are still lagging. Their overall shortfall totals about 52 million tons.

The fulfillment of the freight and passenger turnover plans for the four years of the 12th Five-Year Plan was ensured. The average train weight increased to 76 tons. The average static load of the railcars increased by 560 kilograms. Locomotive productivity rose by 60,000 gross ton-kilometers.

The labor productivity of the workers engaged in shipping increased by 19.7 percent in the face of an overall target of 12 percent for the five-year plan. Some 560 million rubles of profits above and beyond the plan were received.

Production of Rail Line Equipment Lagging

904H0091D Moscow GUDOK in Russian 23 Dec 89 p 2

[Article by GUDOK correspondent O. Dyachenko, Moscow: "The Heavy Lot of Heavy Machinery"]

[Text] *From a decree of the USSR Committee of People's Control: "...The USSR Ministry of Heavy, Power and Transport Machine Building [Mintyazhmash], the principal supplier of track equipment, has not once over the three years of the five-year plan fulfilled the stipulated directive targets or achieved a rise in the technical level and quality of their items. The requirements of railroad transport for track equipment are only 37-percent satisfied as a result. About a third of the machinery that has fully served out its standard service life remains in operation..."*

That is why the representatives of Mintyazhmash were so uncomfortable at a session of the USSR Committee for People's Control [KNK] chaired by G. Kolbin. The facts they cited really were blatant, and the numbers depressing. About 250,000 people are engaged in track maintenance (and that is primarily heavy physical labor), and over 40 percent of them are women. The enterprise plans for the output of track equipment have been considerably lower than government targets over all the years of the five-year plan despite this. But they haven't handled those targets either. Shortfalls of machinery and equipment are moreover implicit in the draft plan for next year as well. The USSR Council of Ministers decree "Steps to Provide Rail Transport with Track Machinery" that was adopted back in 1986 will consequently not be fulfilled again. And this is in addition to all of that enumerated—thousands of daily warnings to limit train speeds, reductions in the traffic capacity of trunk lines. And, as a result, interruptions in the delivery of national-economic freight.

I involuntarily caught myself on the idea, while listening to the report of a sector head from the KNK Machine-Building Industry Department, V. Ivanov, that the counter-arguments of executives from the manufacturing plants would now follow without fail. And their arguments would moreover be similar, and the justifications at first glance convincing. And that is what happened.

The director of the Tikhoretsk Machine-Building Plant for Heavy Track Machinery, A. Fendrikov, while admitting the fairness of the shortcomings pointed out, launched an immediate offensive against allied ministries, which, despite that very same government decree, had not provided this, had not improved that, had not manufactured this, had not developed that... Much they had not done.

The director of the Engels Transport Machine-Building Plant, G. Nazarov, spoke even more categorically. It turns out that there has never been a modernization at that enterprise, which has a history of over a hundred years. The equipment is functionally and physically obsolete. The shop for the production of snow-removal equipment has not been put into service. The plans that were thrust upon them, in short, did not correspond to existing capacity.

A closed circle has resulted. How can you make demands of those in a hapless situation themselves? The conclusions of the Committee of People's Control, however, proved to be different—you not only can, you must! Here are the facts. That same Tikhoretsk Plant has regularly failed to fulfill its contract obligations. They were only 76-percent met last year. And the director once more approves a plan reduced by a third versus the one stipulated by the ministry. Even that one is threatened with disruption, however. And that plan, after all, had been calculated and economically substantiated at the enterprise. And it would seem that everything exists for it: capacity, constituent parts, human resources.

The enterprise has paid about 400,000 rubles in fines for shortfalls of output over the last two years alone. (And what are they to the track workers? You can't replace track with rubles, even big ones.) As for the capacity, the shortage of which A. Fendrikov was complaining about, it is being utilized at a level of just 50-70 percent at the plant. The shift-work factor of the machine-tool inventory is very low. The labor-intensiveness of the manufacture of track equipment is more than double the planned level.

Isn't there some slack there? And why are the directors of the plant effectively not resolving issues of the implementation of radical economic reform, forms of organization with economic accountability, labor and incentives, collective and lease contracts and the creation of industrial cooperatives? Here is where the true reserves of strength of the enterprise and its labor collective lie! They should be developed and strengthened. But the leadership of the plant is choosing a different direction—fudging the numbers and deception, the illegal inclusion of machinery that has not passed state acceptance in the statistical reporting. It has, as a result, gone out to the lines (and moreover, as I was told, with the sanction of MPS [Ministry of Railways]) in incomplete and, to put it simply, unworkable condition. And some 4.8 million rubles of such equipment has been shipped off over the last two years.

Effectively everything that has been enumerated, with the exception of the fudging, could apply to the Engels machine builders as well, although they have their own variations there too. The government targets set last year for the output of the new SM-2M snow-removal train and the SPU-N snowblowers have been broken. The production of the trains was only begun this year, while the snowblowers are planned just for the second half of next year. The words of G. Nazarov on the modernization of the enterprise require particular comment. It has begun nonetheless. But the plant is using barely half of its production capacity.

The question of whether the new construction projects, in which about 20 million rubles have been sunk, will be transformed into dead capital is a reasonable one. And quite a healthy sum of it has accumulated in the Mintyazhmash system. More than 100 million rubles have been invested in the foundations and pilings of unfinished work over the past three years alone. And that is instead of concentrating efforts on the comprehensive start-up of new capacity. Need one be surprised after this that the third phase of the main wing has been under construction at the Tikhoretsk Plant for twenty years now?!

The poorly thought-out nature of management decisions in the ministry is obvious. I will cite another example for clarity. An experimental prototype of a system for the solitary replacement of ties was created in 1986 that made it possible to free up dozens of track layers and provide an annual economy of 400,000 rubles. This equipment was to have been manufactured, starting last year, at the Kirovsk Machine-Building Plant, for which it was twice included in the state order. The ministry, however, after two years of red tape, decided to transfer the production of the system to the newly constructed Kirovograd Track Machinery Plant. The start-up of capacity there is not planned at all for the next few years. Those are the prospects.

And what if we look into the distant future and reflect a little on what the plants are giving the track workers today? The machinery being manufactured, in the words of Track Machinery TsKB [Central Design Bureau] Director V. Stebletsov, conform 90 percent to world models. But how can that statement be tied with the results of inspections, in which it became clear that much of the domestic machinery is inferior to foreign models in a number of indicators (high unit energy consumption, lack of automation systems for operational processes, low productivity)? And they frequently come to the customer, in the words of Far East Railroad Deputy Chief V. Sukhinin, with factory defects (first the hydraulics fail, then the engine starts knocking). There's your world level!

What is more, the development of even that track equipment takes many long years at the TsKB. Not one of the pieces of machinery developed in the current five-year plan has been patented abroad, not a single license has been sold. Is this a result of the low level of supervision of the scientific and design subdivisions and the poor incorporation of contemporary planning methods into practice?

I think one need not be surprised at such a state of affairs in the sector when one of its leaders, Deputy Minister V. Abramovskiy, having made the rounds of all the enterprises named, admitted at the KNK session that he had not looked into all these issues. And could Vitaliy Fedorovich have done so if he preferred foreign trips to trips to the manufacturing plants?

I found all these data in information prepared by the Machine-Building Industry Department. It was also pointed out in the same place that it was namely V. Abramovskiy who had three times given permission to the Tikhoretsk machine-building people to include output that had not yet completed production in the state reporting. That is, he essentially sanctioned the deception and fudging.

He and the managers of the enterprises were punished for all that they did. But, candidly speaking, I was not left with a feeling of complete satisfaction from the decree of the USSR Committee of People's Control. The representatives of the allied ministries that had disrupted deliveries of constituent assemblies to Mintyazhmash for the production of the track machinery and had dragged out the construction and modernization of the machine-building plants were not heard from. The possibilities for the Ministry of Heavy, Power and Transport Machine Building to produce these assemblies and parts at their own plants or for direct ties or mutual cooperation were not considered. No serious reproaches were directed at the USSR Council of Ministers Bureau for Machine Building, which is clearly inadequately monitoring the decree enacted by the government.

But most importantly, the reason the committee session—which did not find an answer to the question—was held: when will the railroads of the country be provided with modern, highly productive track equipment?

Rail Modernization Efforts, Direction Questioned

904H0091E Moscow GUDOK in Russian 23 Dec 89 p 2

[Interview with All-Union Scientific and Technical Society of Railroad and Transport Construction Workers Central Board Deputy Chairman Ivan Vyacheslavovich Biryukov by M. Kosolapova under the rubric "On the Course of Technical Progress": "The Right to Expert Analysis"]

[Text] *The editors receive dozens of letters from rank-and-file workers of the sector and commanders of transport, as well as from scholars, which contain the questions: why are those who will have to raise up the backward sector not familiar with the Program of Technical Retooling and Modernization of Rail Transport? Is it really not worth it for all the people to discuss the concept of incorporating technical progress on the steel mainlines of the country?*

These same questions were posed by the participants in a recent forum of railroad workers. But not one of the seven

sections that were working at the All-Union Conference was devoted to this topic. Even though the discussion concerned new equipment and progressive technologies where matters concerned the locomotive, railcar or track workers etc., the problem was not discussed in general, with references to the fact that the program is being considered at the highest levels.

The sector, possessing enormous potential in the form of people who are creative, searching and indefatigable, can resolve the tasks that have been posed. But under one condition. The priority in the new program should be the person—the creator of the new and progressive—and not the quantity of new lines, locomotives or other rolling stock.

The Central Board of the All-Union Scientific and Technical Society of Railroad and Transport Construction Workers [VNTO], whose last plenum took the direction of a determined review of the goals and tasks of society, holds this stance. Our correspondent talks with the deputy chairman of the VNTO Central Board, Professor I.V. Biryukov.

[Kosolapova] Ivan Vyacheslavovich, the forms and methods of the work of sector scientific and technical societies have for many years not conformed to the requirements made of similar organizations abroad. Initiative groups dissatisfied with their activity have lately not coincidentally achieved the creation of new societies and associations. And it must be acknowledged that they form their ranks at the expense of the most active portion of specialists who have lost faith in their own such organizations. How do you evaluate this from the viewpoint of the situation in rail transport?

[Biryukov] The trends you are talking about have unfortunately not bypassed us either. At the beginning of 1987 the society numbered some 550,000 members. By the end of this year we were 50,000 short of that amount. There are grounds to suppose that we will become several thousand people smaller still by next year. The losses are especially large for the Moscow, October, North Caucasus and Baltic railroad NTOs [scientific and technical societies]. Many engineers are leaving the society, seeing no real return on their contributions.

[Kosolapova] That is evidently occurring due to the heightened demand among people today toward the usefulness of any public organization and the unsatisfactory level of its activity?

[Biryukov] The Central Board, while acknowledging the enormous responsibility to many thousands of people, gave an objective evaluation at its last plenum of the state of affairs in the society. If we do not want to lose the most creative and active portion of the railroad specialists, in whose hands the fate of technical progress essentially lies, we are obligated to pursue policies that would make it possible to reinforce the organization and bring its activity as close as possible to the demands both of the members of society and of transport itself. That opinion was a unanimous one at the plenum.

[Kosolapova] The loss of prestige of the society and the unenviable role, we will say, to which it has been relegated in the sector, as far as I know, are evoking universal concern.

[Biryukov] Whatever the issue being discussed, we return to our history every time. Take, by way of example, the Russian Technical Society, which made a colossal contribution to the development of domestic science and engineering. Its transport department at one time took anactive part in holding the competition for the Transsiberian Mainline, the expert analysis of the three right-of-way variations proposed and a large number of other projects. We can judge its effectiveness from this. Over four months in 1894, this department prepared 58 projects and did an independent expert analysis of them. What is more, 36 of them were declined and only 22 were realized.

[Kosolapova] And if we seek an analogy today?

[Biryukov] Many of the organizations and specialists from the USSR Academy of Sciences, USSR Gosplan and so forth that are involved in the discussion are enumerated in the MPS [Ministry of Railways] directive on scientific and technical work associated with the construction of the Center-South mainline. But there are unfortunately no railroad or transport workers there from the VNTO. The same could be said of the competition that has been announced by MPS and prepared by its scientific and technical main administration on issues connected with the right-of-way and engineering of the mainline. It has addressed many organizations, but does not envisage the participation of the VNTO. There is not even a single representative of our society on the competition committee. Dedicated comprehensive transport programs have been adopted without regard for its opinion.

[Kosolapova] Common sense suggests the necessity of seeing that societies of engineers become a partner, or in essential cases an opponent, of the sector administrative-management apparatus in resolving issues of technical progress...

[Biryukov] Things are not yet shaping up very smoothly with partnerships, as follows from the example of the Center-South line. Things are more complex with the role of opponent. Glasnost has allowed us to publicize many negative instances and to show where matters can end up when there is a monopoly of opinions. The successful development of all of society is impossible without the expression of independent opinion. Any developing system needs this, as do the Ministry of Railways and the Ministry of Transport Construction.

Similar precedents exist in world practice. The federal government in the United States, for example, annually orders various expert analysis and consulting of two billion dollars. Not a single project is considered in the States without regard for the expert analysis of the very prestigious American Association of Engineering Organizations.

Another example. Some 10 percent of the financing of scientific-research work for the independent expert analysis of all major projects and programs in its field is allocated to the Society of Mechanical Engineers in the United States. Highly paid experts, guaranteeing thorough and independent expert analysis, make up the core of such societies.

[Kosolapova] It is very difficult, under existing conditions, to make the opinion of the VNTO independent of the opinion of the ministry apparatus. All of the leadership posts in the society, after all, are occupied by representatives of the administration. And they can scarcely become opponents of themselves.

[Biryukov] When a person takes up the position of, for example, chief engineer (of a railroad, division or enterprise) today, he actually becomes the leader of the NTO regardless of his inclination toward such types of activity or trust on the part of the members of the NTO. Almost all of the participants in the plenum, recognizing this contradiction, favored alternative selections for all levels of the NTO hierarchy.

[Kosolapova] Judging from everything, only a public organization that someone needs has real chances to exist, and who is ready to finance it? Who, in your opinion, truly needs a scientific and technical society?

[Biryukov] Everything depends on what it becomes. If the NTO is able to help growing engineers realize themselves, if their creative activity within the framework of the society has an effect on their practical career (as, by the way, was done and legally secured in Finland, where job advancement depends to a considerable extent on the stance of the scientific and technical society), then that contingent will be for us.

If the creatively mature engineers of the NTO render assistance through their independent expert analysis, reputation and financial support, as is done in China in particular, then that group of people will be with us as well. We intend to attract the intellect of leading specialists and scholars for the dispassionate expert analysis of major projects and programs, as is done not only in the United States, but in a number of the countries of Europe as well. They will also have a vested interest in the NTO. We will invite creatively active veterans of society who are retired as well. Their vital and professional experience can still be a service to our cause. We will establish incentive supplements to their pensions, help them to resolve issues of rest and so forth.

Such activity as invitations to give lectures will also obtain the support of the engineering community.

[Kosolapova] An alluring prospect. But you will agree that, so far, the person is on somewhat of a secondary plane here. If the society begins to work for the person, then I am convinced that they will pay dues of perhaps 5 or 10 rubles, and not 1 rubles 20 kopecks, and won't think about leaving the NTO.

[Biryukov] I agree. There have been almost no issues devoted to the engineer and his business career among the topics of the sessions of rayon, railroad and VNTO Central Board sessions, the same way as there have been none connected with the creative growth of our scientists. I hope all will be different now.

The plenum was unanimous on one thing: our society should have, let's say, a kind human face. The person is the chief concern. Our dream is engineers' halls, equipped for minimal comfort, where people can come to relax after the workday. Where they can meet like thinkers, colleagues according to their interests, and have a cup of tea or coffee. And toss off a sketch of a future part on a drafting board in the next room, and run off a few calculations on a personal computer in the corner, or at least a programmable calculator. The spending on these halls should be included in the social-development programs of the sector. And life instilled in them by the railroad and rayon divisions of the NTO.

A model of the society is thus outlined as a creative union of like thinkers seized by the idea of the development and enrichment of the sector and accomplishing their activity with complete economic self-sufficiency. But the rank-and-file members of the NTO have the last word.

MARITIME AND RIVER FLEETS

Shipbuilding Enterprises Activities Reported

904H0106A Leningrad SUDOSTROYENIYE in Russian No 12, Dec 89 pp 37-39

[Article: "At the Shipbuilding Enterprises"]

[Text]

The Black Sea Shipbuilding Yard Production Association

An unusual meeting took place on 7 April at the Black Sea Shipbuilding Yard. The dry-cargo ship Poltava, built by the Black Sea workers in 1962, visited the Port of Nikolayevskiy before its last run to India (for melting down). The yard workers gave a warm greeting to their guests, A.P. Melnik, captain of the ship, S.A. Konovalov, first officer, G.V. Dorofeyev, third officer, V.V. Rudakov, electrician, and other members of the crew. In the yard's assembly hall, the guests were shown a film on the work and leisure of the shipbuilders. V.D. Bezvikonnyy, deputy chief technologist, acquainted the guests with the exhibits of the yard museum and showed them the slipway from which the Poltava had been launched into the water.

In the evening, at the Palace of Culture and Equipment of the shipbuilders, a meeting took place between members of the command of the Poltava and the shipbuilders who had directly participated in the building of this dry-cargo ship—I.P. Kabanov, G.B. Zaydel, G.M. Saptsov and others. The captain spoke of the crew's work

successes. From the moment the ship began operating, it visited 123 ports in 50 countries of the world, covered 1,092,000 miles and transported 2,030,000 tons of cargo. The seamen thanked the shipbuilders for the good, reliable ship, the 27 years of failure-free service and for its high quality. They wished the yard workers successful work in developing new, highly efficient ships for the maritime fleet. On behalf of the command, the ship's bell and a life belt from the Poltava, and various documents were turned over to the yard's museum. (O.A. Zaretskaya).

Central Scientific Research Institute imeni Academician A.N. Krylov

This unique testing complex, including over 50 basins, cavitation and aerodynamic tunnels and special stands, makes it possible for specialists of the institute to make any studies of the hydro-aerodynamic characteristics of ships. The work it has done includes: preparing recommendations for the selection of hull members and engines, optimizing ship elements as the result of model studies of the propulsion qualities, seaworthiness and steerability, reproducing operations situations at various depths of a water area, determining the external loads acting on the hull and steering, improving the aerodynamics of the above-water part of the ship, calculating the dynamic parameters of towed consists, etc. At the international exhibition "Rechnoye sudokhodstvo-89" [River Navigation-89] in Leningrad, the TsNII imeni Academician A.N. Krylov was the first to present an independent exhibit. Among the developments proposed was a method of optimizing the shape of the fin keel and steering complex of a sports yacht. It provides for comparative calculation of the efficiency of various types of keels, optimizing the shape of the underwater part, evaluating the tacking qualities of a yacht, making a group of model study tests, preparing blueprints for the manufacture of yacht fins in the required scale (including 1:1 for a keel measuring up to 2 X 3 m).

Leningrad Admiralty Association [LAO]

On 14 March, a founders meeting of the Association of Leningrad State Enterprises (Associations) was held at the ispolkom of the Lensovet. Among its founders is the LAO. The association was called upon to improve territorial management of enterprises and facilitate the establishing of direct ties between them. Among its basic tasks—combining the intellectual forces of the enterprises, developing new types of production (particularly—consumer goods) and concentrating efforts on implementing social programs. The association will contribute to working out economic methods of management, overcoming the pull toward a "natural economy" (a common bank of equipment and press-forms, for example) and organizing more specialized production. The construction of objects for the social sphere, including housing, naturally, is being facilitated with the setting up, on an equal footing, of a general construction base, and with combined use of equipment, materials and financial resources.

Vympel Shipbuilding Production Association

One of the most important directions of technical progress in the association is improving the welding production and flow lines for thermal cutting of rolled metal. Equipment that has proven itself well is the Mark-500 unit for argon arc welding of structures made of aluminum-magnesium alloys, Granit-ZuZ semi-automatic machines, BBR-1200 ballast rheostat units, and a console stand with an ADSV-6 automatic welding machine. To increase the reliability of the work of a laser metal-cutting line, equipped with Biryuza-2 machines, it is specified to replace the ChPU [digital program control] system and a number of actuating mechanisms, introduce blank unloaders, etc. New, improved machines will soon come to replace the Kristall TPL-2.5 type for plasma cutting of rolled metal. In conjunction with the Nikolayevskiy Shipbuilding Institute, work is being done in connection with introducing the assembling-welding equipment for automatic welding of joints and T-connections of hull structures at the unit manufacturing diesel tug sections, as well as in connection with the development of a flexible production system at the section for thermal cutting of sheet parts in the series construction of small ships.

Ritm Scientific Production Association

The first joint venture in shipbuilding was created in the middle of this year by the Ritm NPO and the Swedish Sedervall firm, which for many years has specialized in the production of stern sealing. The purpose of the enterprise's activity is to produce ecologically pure sealings in accordance with the jointly developed technology, as well as various roller bearings. Here, Swedish industrial technology and original Soviet technical designs and domestic synthetic materials will be used.

Business contacts with the Schiffbau National Combine (GDR) have existed for over 20 years. They have resulted in the efficient gas-cutting machines, pipe-bending machine tools and painting equipment developed. Therefore, it is in conformity to principle that a contract has been concluded on direct scientific-production relations between the Ritm NPO and the Schiffbau Combine, aimed at improving shipbuilding technology and creating new equipment, introducing the results of work at the shipyards of both countries and series manufacture and sale of products. Expanding the ties in the social sphere in the form of exchange of delegations and groups of young people is also specified.

Another form of international cooperation is the joint discussion of scientific problems. For this purpose a young people's scientific-technical conference of the Ritm NPO was held, in which a group of young scientists from the Bulgarian State Economic Association Sudostroyeniye took part.

The Zaliv Shipbuilding Yard imeni B.Ye. Butoma

In accordance with the Law on the State Enterprise (Association), the yard collective obtained the right to

establish additional benefits for workers through wage funds. Considering the tasks facing the yard, the administration, professional committee and council of the work collective worked out, discussed and approved the statute "On Benefits for Welders of Metal Ship Hulls and Electric Welders of the Building Berth, Assembly-Welding, and Dock Shops, and also of Students of the Base SPTU [secondary vocational-technical school] for These Vocations." Beginning on 1 January 1990, workers in these vocations who have at least 25 years (for female electric welders—20 years) of continuous service in the shops named, upon retiring on a pension for age, will be paid a one-time monetary stipend in the amount of 20 months wages. To accumulate the necessary sums in the bank, a special account has been opened into which part of the capital from the unified material incentive fund will be placed. The statute also specifies other benefits, specifically, payment of a guaranteed remuneration according to the work results for the year, and for young workers—advantages in obtaining housing and interest-free loans in the amount of 1500 rubles, to SPTU students—higher payment for doing practical production work. For auxiliary workers, engineering-technical personnel and employees aged up to 30 years, who wish to master the occupation of ship fitter or electric welder, in the training period an average wage will be maintained for 6 months, and then all benefits will also be extended to them.

Baltiyskiy Zavod Production Association

In the middle of this year the association found itself in a serious situation. The reorientation of production and cutback in the number of large orders were an unusual knockdown for the enterprise. Specific measures were adopted for a way out of the situation that had formed. Specified, in particular, was organizing the building of ships with the horizontal cargo-processing method and activating work on icebreakers. On 4 October, the day that the icebreaker Oktyabrskaya Revolyutsiya was launched, the keel was laid for the next nuclear-powered ship, the Ural. Next year the output of consumer goods will be increased approximately 1.5-fold, reaching a volume of almost 23 million rubles. The production of cooking boilers will double, up to 6000 units, and the supply to the population of hangers for anterooms, aluminum canisters, etc. will increase considerably. Leningrad enterprises will obtain lines for the production of pelmeni, coffee-making equipment, and lines for champagne production.

Krasnoye Sormovo Yard Production Association

On 24 June, as we know, the Day of Inventors and Efficiency Experts, and for two days before, the association marked the 70th anniversary (1919) of the innovative activity at Krasnoye Sormovo.

At the end of the 1920's, circles of efficiency experts began to be formed, and a considerable increase was observed in the proposals brought forward and introduced. It was very prestigious to be an efficiency expert at that time. The best innovators received material prizes—suits, for example, bicycles, etc. In the years that have passed, the shops and departments have utilized 117,550 efficiency suggestions and 700 inventions. The effect from just 11 inventions of V.A. Terentyev, one of the best efficiency experts, is over 3.5 million rubles. Inventors B.D. Savonichev, A.N. Osipenko, V.A. Krasnobayev, Yu.M. Khokhlov, N.P. Mayorov, G.I. Snegirev, and others made a great contribution to improving production. Now, when conservation is becoming an important rule for the work of the shops, departments and the association as a whole, the role of inventors is increasing even more.

Volgograd Shipbuilding Yard

The personnel problem at the yard has recently been exacerbated. While in 1987, this problem did not even exist, beginning in 1988, because of the sharp growth in the cooperative movement, a perceptible outflow of workers in the basic occupations began. On 1 April of this year the shortage of lathe turners, millers, assemblers and welders reached 300 persons. At the same time, the graduates of the technical school, after working a few months, are sent off for army service, without having succeeded in becoming attached to the collective or the yard. In order to improve work with personnel and reduce their turnover, the "Public Personnel Department" was created, which helps the workers in the transition from shop to shop, very carefully examines the reasons for putting in applications for discharge, and performs appropriate individual work. It is also planned to invite school graduates directly to the yard as apprentices.

Vyborg Shipbuilding Yard

Expenditure of the currency funds earned by the shipbuilders—this was the problem discussed at the regular meeting of the work collective council. It was decided to transfer some of the money (Finnish marks) to the city budget. The funds allotted (100,000 rubles) will go to develop local industry and purchase modern medical equipment.

Yaroslavskiy Shipbuilding Yard

When the group of reserve supervisory personnel was formed for the yard this year, the competitive principle was used. Any worker feeling able to do so could put in an application for participation in this competition. Out of 18 aspirants, 10 persons were chosen who corresponded to the greatest extent to the requirements made for the middle and upper unit of management. They were all sent for training at the Yaroslavskiy branch of the institute for raising the qualifications of supervisory workers and specialists. After a month of studies on modern methods of economic activity, a probationary period was specified in the main departments of yard management.

Oka Shipbuilding Yard

Is the way in which relations between the foreman and the workers are formed important for a business? The workers of one of the sections of the yard appealed to the

STK [technical systems complex] shop with a request to elect a new foreman. There were many grievances. They set up a committee to review them. The arrogant attitude of the foreman toward the workers and his clashes with the brigade leaders were decisively confirmed. At the elections held later, top place was given in the speeches of the workers to the personal attitude of the supervisor toward the people, on whom the production indicators in many ways depend. As the result of the elections, S.N. Shepelev, who had been working in this shop for 10 years, became the new foreman.

Economist Scores Black Sea Shipping Fleet

904H0101A Moscow VODNYY TRANSPORT in Russian 30 Dec 89 p 2

[Article by S. Nikulin, deputy chief of Economics for the Black Sea Shipping Company: "The Gaps in Transport Expenditures"]

[Text] **On 23 December of this year our newspaper published material with a proposal to correlate the advanced experience in the sector. All the specialists of the Ministry of the Maritime Fleet were invited to take part in the discussion. Today an economist from the Black Sea Shipping Company shares his ideas on this subject.**

Our fleet is getting old. Ships 15-16 years old simply do not have the right to call in many ports of the world, according to existing local laws. The situation is not much more optimistic with the shore facilities. Let us take, for example, the Black Sea Shipping Company, the largest in the country, with fixed capital of scarcely less than one-fourth of the capital of the entire sector. So then, the coefficient of wear of the capital for the fleet and shore last year reached 45.7 percent.

This year alone, the lack of a shore repair base for ships of the Black Sea Shipping Company, according to preliminary estimates, will cost the State losses of 37 million rubles of currency receipts.

There is no denying that it is, of course, cheaper to repair these ships, not to mention the fact that we need the currency profit, and not just today. The critical state of the transport fleet, in all probability, is not particularly alarming to our government. After all, it goes without saying, the fleet is far from the first order of priority for capital investments and currency, for there is simply nowhere to build modern ships today.

The prospects are distressing. By the end of this five-year plan, the number of our cargo ships will have diminished by 8 percent, with a cargo capacity loss of 6 percent. If this is explicable only by counting on intensification of the transport process, by the end of the 13th Five-Year Plan the fleet of the shipping company will be reduced by 35 percent, with a 24-percent loss of cargo capacity. These losses cannot be made up for by any intensification.

Maritime transport has an obvious advantage as a type of transport. Its output contains minimal expenditures for past work. It would appear that everything is simple—you invest money, provide fuel and personnel and you earn currency. We, however, are losing the fleet. This loss, truly, means almost nothing as compared with the real losses, which the state will incur in the near future, if it does not change its attitude toward the fleet. By losing it, we come increasingly close to direct dependence on foreign shipowners.

Having announced self-financing and cost accounting in the sector and given the shipping companies the status of a State enterprise, we have thereby given rise to the many contradictions, holding back this cost accounting, most of all in the legal respect. Specific organizations such as maritime shipping companies, combining maritime transport, transshipping cargoes in the ports, servicing the fleet, ship repair, supply, fuel and contracting activity in construction, have proved to be virtually not written into the framework of the Law on the State Enterprise.

Each of the functions named is almost an industry, in turn possessing a network of enterprises and structural units. This is the way the associations conflicting with the law appeared when combined—for example, the repair-building trusts with their management and the trade administrations with their offices and bases. Merging them into single enterprises would signify simple financial chaos. The main curious feature is the fact that the shipping companies do not have the right, as they did before, either to manage or to use the ships at their own discretion.

Is this lawful? If fulfillment of the task set by the Party Congress is placed as its goal, it is indisputably legal, but the question involuntarily arises: of what use is self-financing and cost accounting here? After all, the directions that the ministry assigns for the work of the fleet may be low-profitable or even unprofitable. The shortage of funds and resources allotted for the development of the sector according to the norms (12 percent of the profit remains with the Black Sea Shipping Company, and the rest is transferred to the budget, and resources are accordingly assigned for this), turns the concept of self-financing and full cost accounting, to put it mildly, into a low-profitable one.

The final undermining of the authority of this idea occurred after the introduction of the well-known decree on improving wages. This routine practice, quickly carried out in the shipping companies, led to irreversible results under the conditions of an aged fleet, requiring careful maintenance, and a low-capacity shore repair base. The ships' crews were cut back, and the curve of the technical state of the fleet immediately dropped.

In reality, our colleagues from other countries maintain crews and half as many again on their ships, or else half as many, but they only operate the ship and never deal with repair, painting, knocking off rust, etc. Meanwhile the routine formula for intensified propaganda is

observed—transition to the second model of cost accounting. Sectorial science assures us at the top of its voice that the second model is preferable. It paints a picture of the charm of the situation when the wage fund will progressively grow, with a saving of material resources, and modestly and truly mentions that it would not be a bad idea to change the principles of calculating the normative ratio, making it less strict.

The working documents for the Statute on Long-Term Planning for Maritime Transport and the Concept for Determining Economic Norms for the 13th Five-Year Plan are being prepared in the same proclamationary-invocatory spirit. Here again is the drive toward the method of Doctor Pilyulkin—recommending castor oil for all diseases. In our case, normatives, cost accounting and self-financing in both industry and transport are suggested for all diseases.

What can one say here? Let us remember Marx's thesis on the cost of a commodity when the output of transport itself is a stage of producing the commodity, its cost is borne as an additional cost for the commodity itself, and we trace the way in which the economic incentive funds of the shipping companies are used. For many of them the production development fund is underutilized by tens of millions of rubles—there are no limits, no resources, and the material incentive and social development funds are also underutilized due to the impossibility of developing housing construction (the economic method is not boundless). Is this not a graphic example of an inflation-stimulating mechanism?

The mechanism operates by double traction: on the one hand—the rise in the transport revenues, leading to a rise in the production cost of the industrial product and diversion of commodities for additional transport, and on the other—growth, without commodities, of the economic incentive funds of the transport enterprises.

A not unnecessary stroke to the portrait of self-financing in transport will be the problem of confidently coordinating the regional cost accounting, which demands the right to life, of the shipping companies—essentially major associations under Union jurisdiction—and the problems of the cities and oblasts, on the territory of which the shipping companies and their ports, yards and other enterprises are located. It is obvious that for them, the organizations of the maritime fleet are outcasts and hangers-on, giving up the lion's share of the funds in centralized fashion to the state budget, but ostensibly utilizing the territories, water areas and coastal zone.

Cost accounting for the transport enterprises, which are still according to the economics textbook in our country, should form a unified transport chain, stretch this chain out to various parties, and intensify the difference in development of the production base not only of various types of transport, but also within these types. For example, the development of the shore base may prove to be inconsistent with the development of the fleet.

Perhaps I have laid it on too thick, but right now the fate of the fleet is very alarming. Will we perhaps seek other paths—nonstandard and nontraditional—and not sweep aside the experience of the past to please the seemingly progressive, but not always all-purpose methods of today's economy?

One thing is clear: a scrupulous search is needed for sources of financing, resources and contractors for prompt repair and updating of the rolling stock of the transport and service fleet. After all, both it and the shore base should be developed harmoniously, and should ensure the appropriate throughput of related types of transport. We must sharply raise the material and social interest of the fleet workers, as representatives of a specific, well-thought out personnel policy requiring the careful selection of professionals, in order to keep them within the sector.

An analysis of the fixed capital of the maritime transport enterprises shows that a foreign-produced fleet is mainly used in foreign transport and in coastal trading, because of the fact that the country does not have the necessary shipbuilding base. There is less currency equipment in the structure of the fixed capital of the shore enterprises, even though its proportion is still quite high. One should probably proceed from this premise, after instructing the sector, and not the individual enterprises, to earn independently the currency resources to update it.

In general the government should seemingly agree that the sector—the maritime fleet—should at the present stage work mainly on its updating, and the currency earned should be distributed in a centralized fashion and in proportions which should be based on the priorities of the shipping companies presently able to ensure its maximum influx to the sector, combining this task with satisfaction of our foreign trade demands. The proportions should be established only from the general mass of receipts and should be sufficient to satisfy at least the sector's minimum demands for updating the fixed capital.

The fleet's labor productivity index needs immediate revision. Wages should be restricted by only one limit—the proportions of the wage fund in the total of expenditures. At the same time the principle of payment should be built primarily on the length of service and qualification level of the workers. Giving up a system of stimulation for the personnel of the sector and the achievement of maximum incomes, and a transition to stimulating a rise in the effectiveness of expenditures should have a positive effect on the state of price formation for transport-intensive commodities.

Nuclear Fleet Personnel Problems Discussed

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[Interview with A. Sinyayev, deputy chief of the Murmansk Shipping Company, chief engineer of nuclear power units, by D. Tarakanov, VODNYY TRANSPORT correspondent:

"The Specialists Are Leaving... But Not From Fear of the Reactor"; Murmansk, date not given]

[Text] **Some 67 percent of the specialists working on nuclear-powered ships intend to leave for transport ships at the first opportunity; 31 percent want to "change" to diesel icebreakers; 2 percent—to transfer to shore enterprises. Some 112 persons have left the nuclear-powered icebreaker Sibir in a little less than two years to work in other places.**

Worried about the situation, the nuclear-powered ship operators themselves made this sociological inquiry, and on the initiative of the sector of technological control organized a "roundtable," to which members of the council of the work collective, the chairmen of the trade committees and leading fleet specialists were invited.

Our correspondent D. Tarakanov chats with the chief engineer for nuclear-powered units—A. Sinyayev, deputy chief of the Murmansk Shipping Company, about the results of this meeting.

[Tarakanov] Aleksandr Kirillovich, these inquiries cannot help but put one on guard. Must it be assumed that it is not from fear of the nuclear units that the specialists are leaving nuclear-powered ships?

[Sinyayev] Of course it is not. The main reason lies in the social problems. People are beginning to seek another work place mainly when there is no hope of obtaining housing relatively quickly. Really, we have to wait about 20 years for it. Until recently, the quite high wages somewhat compensated the seamen on nuclear-powered ships for the difficult conditions of work in the Arctic, the shortage of housing, kindergartens, etc. Now the ruble has noticeably depreciated, and the real incomes have dropped.

A misalignment has also appeared in the wages. The seamen on transport ships working abroad receive per diem subsistence allowances in foreign currency and in VTB [Foreign Trade Bank] checks. With the acute shortage of goods on the domestic market, the value of each ruble of foreign currency earned is increasing rapidly, while the value of the Soviet ruble is dropping.

These are the main reasons for the personnel turnover in the nuclear-powered fleet.

[Tarakanov] Other factors were referred to at the "roundtable." For example, the unsatisfactory catering, particularly the lack of fresh products, vegetables and fruit. The seamen complain about the mass of delays encountered by their relatives who want to come on board the nuclear-powered ship when it is at anchor, and the humiliating procedure of customs examination when they go ashore in their native port.... All this creates a very cheerless picture. Which of the problems can the shipping company solve itself, and what is being demanded today from the higher authorities?

[Sinyayev] You know, a few years ago, the Arktikmorneftegazrazvedka Trust was created in Murmansk. Here is an example of long-range planning for you. I will just make the immediate proviso that I do not know the problem of the trust, but one thing is obvious—the trust received sufficient funds for its future development, in a very short time a substantial office and its branches were built, housing is being intensively constructed, and a whole little town is growing up on the western shore of Kolskiy Bay. There were no problems with human resources! Many of our specialists, and seamen of the fishing fleet went there.

The nuclear-powered fleet, however, developed quite spontaneously, and its operational problems have thus been piling up for years.

What can be said today? We are, of course, improving the food rations, and we are revising the throughput conditions. Together with V. Beletskiy, chief of the shipping company, we studied the lists of demands and comments brought forth by the nuclear-powered ship operators, and came to the conclusion that they were all almost 100 percent justified, and require immediate intervention. We gave these proposals to the divisions and services, and are gathering the opinions and discussing variants for solving the problems at the council of the work collective.

In 1990 we should double the volumes of housing construction—both through ministry appropriations and through construction by the economic method.

It is worse with wages. Today's would have been high enough, if it were not for the reasons of which I have already spoken. With the transition to the first model of cost accounting, the Murmansk Maritime Shipping Company was able to find internal reserves, which led to good production-economic indicators and made it possible to raise the wages for the seamen through our own funds without any help from the government. The reserves were not inexhaustible, though. The complex economic situation on the whole throughout the country is also having an adverse effect on the future of our shipping company—no serious development of the fleet and the sphere of its utilization is foreseeable in the next few years, and we cannot sharply increase labor productivity without the intervention of the State. In addition, the session of the Supreme Soviet adopted measures to hold back a wage increase to avoid an increase in inflation.

[Tarakanov] Will this not lead, let us be realistic, to the fleet following the example of the miners and "kicking up"? After all, they say that you, the present directors, have not lifted a finger.... What then? Perhaps these questions must be put somehow differently today?

[Sinyayev] How else can you put them? At one time I prepared a number of proposals for the government. We also appealed to the VTsSPS [All-Union Central Trade Union Council].... They answered us: "It is bad everywhere, you are not the only ones!" We struggled for two

years with the draft of the government decree, coordinated it in Goskomtrud and the Ministry of Finance, and almost gained support.... But they replaced the personnel on top, and our draft was pushed into the corner along with the proposals on payment for night and Sunday work, for length of service, etc. They said: "Go look for reserves."

We are looking for them. At least, as soon as the value of the Soviet ruble dropped, we directed proposals to the Main Economic Administration of the Ministry of the Maritime Fleet on partial payment for nuclear-powered ship operators with checks from the Foreign Economic Bank. We realize that there are serious contradictions in this statement of the problem, but what else can you do—somehow, if only within the limits of the shipping company itself, the tension among the seamen must be reduced. The Murmansk fleet does not operate on regular lines, the main routes consist of tramp transport and work in the Arctic. Some, as we are speaking, are going off "to the left" (abroad), and others—"to the right" (to the Arctic). This, under the conditions of the country's economic difficulties, will always create an explosive situation.

Then, the northern benefits in the form of a regional coefficient and wage increase for polar work—they have noticeably altered in the past ten years. When they began to develop the North, the State established them, realizing that northerners have to live under severe climatic conditions and that the cost of living here is considerably higher. Time passed, though—the polar wage increases were reduced up to 80 percent, and the means of paying them were sought in the local—not in the State!—budget. The total sum for the "polar workers", regardless of what was earned, should not exceed 300 rubles. I could cite a mass of examples, when the wages of the southern workers, without any coefficients and increases, were higher than for the northern workers. And this is among the very same categories of workers.

[Tarakanov] What is the shortage of specialists on the nuclear-powered fleet like today?

[Sinyayev] First of all, there are not enough specialists serving the nuclear-powered units. For the new, already operating,, Taymyr and Sevmorput, and for the nuclear-powered ship Sovetskiy Soyuz, soon coming into service, we had to gather three crews immediately. We partially coped with the task. Even today, however, we are short in the order of 35 persons, particularly operators.

The Leningrad Higher Maritime Engineering School imeni Admiral S.O. Makarov trains the cadres for us, but instead of the necessary 35 specialists yearly they send only 12. We have to look for them in other organizations and VUZes, and then retrain them.

[Tarakanov] How did this cadre shortage arise?

[Sinyayev] We simply ended up with a discrepancy. On the one hand, the reason is that the naval cadets of the LVIMU began to be taken into the army. Now our 4th and 5th year courses are denuded, and we have literally just a few specialists going up for graduation. Yet the 2d and 3d year courses are overfilled today—the students have returned from the army—and the problem will soon turn into its opposite: the "Makarovka " will overload us with specialists, who must be resettled and granted any number of social conditions. The nuclear-powered fleet is after all ours only, and the problems prove to be ours!

On the other hand, the confusion has had its effect on planning the development of the nuclear-powered fleet. Thirty years ago we built a nuclear-powered icebreaker, the Lenin, and we thought—we will build three more and will stop with this. The service base was built for three nuclear-powered ships. Then they announced—we will build 20 nuclear-powered ships. Then—the backwash came, we will build ten. You see what a game of leap-frog it is. Then it turned out that specialists from the Lenin in the early days closed the gap on the nuclear-powered ships Arktika and Sibir, but then the Rossiya appeared, for which there were no solutions in the 1970's. The Sibir came in 1978 and the Rossiya—in 1985! The gap was in no way filled. We suddenly thought: where can we get the personnel? We created a special course. By 1993 our specialists will be trained, but then in 1992 we will obtain the nuclear-powered Oktyabrskaya Revolyutsiya, in 1995, the Ural.... No greater increase is foreseen.

[Tarakanov] The "roundtable" participants also noted that the qualification of the nuclear-power specialists is dropping. Many are giving way under the rigorous requirements imposed on the personnel of nuclear-powered ships and the simplification of the system of transfer for reasons of professional unfitness, which is extremely bureaucratized.

[Sinyayev] Agreed. Even though I, meeting fellow countrymen, prove to them that the problems of safety have been worked out at a very high level (and I am not deceiving them—the equipment is high quality), but quite frankly.... I cannot sleep peacefully. I think that in this case it is forty times better to be overinsured, and this means, to solve many of these problems at the State level, than to be underinsured.

I express the hope that the government will give us assistance, this is on the one hand, and on the other—that the divisions and services of the shipping company itself will have a creative attitude toward the packet of proposals that arrived from the seamen of the nuclear-powered ships, and will issue thoroughly thought out recommendations to eliminate the problems that have accumulated, based on the search for its own reserves.

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